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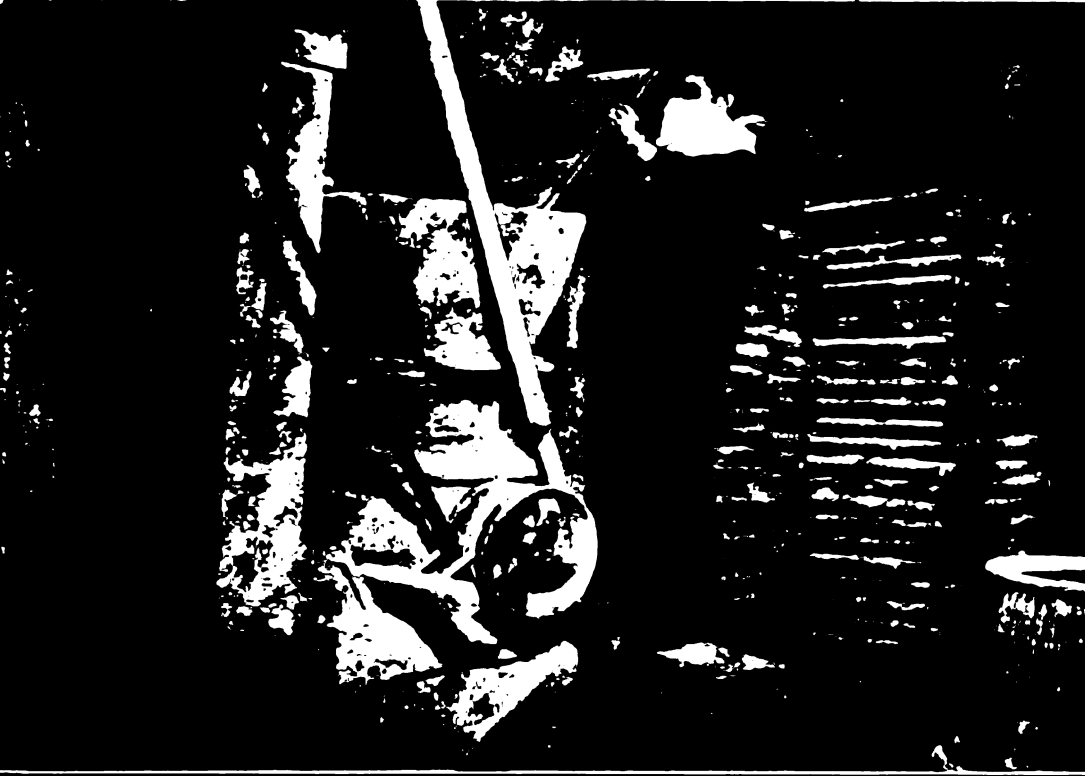
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Industrial diseases

American association for labor legislation,
American medical association

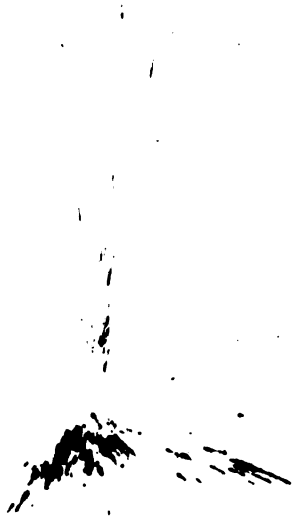
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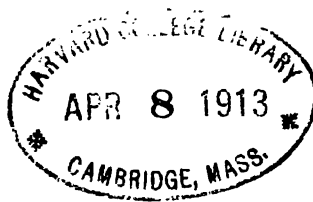
The American Labor Legislation Review

**PUBLISHED QUARTERLY
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Vol. II

**AMERICAN ASSOCIATION FOR LABOR LEGISLATION
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ILLUSTRATIONS

	Facing	Page	
Dry Sandpapering. Wet Sanding with Pumice Stone..	"	"	181
Arsenic Poisoning	"	"	188
Cross Section of Caisson in Full Operation.....	"	"	193
Occupational Skin Diseases.....	"	"	208
Making Lead Colors. Lead Casting, Showing Lead Pot in a Smelter.....	"	"	273
Dust Collectors in a Lead Plant. Emptying a Red Lead Furnace	"	"	276
Lead Used as a Hardening Agent. Heading up Barrels of Dry Red Lead.....	"	"	284
Chaser Room in White Lead Factory.....	"	"	288
Air-Lock on Top of Caisson.....	"	"	353
Separating Screens in White-Lead Factory.....	"	"	360
Workers in White Lead Factory.....	"	"	368
Legal Requirements for Position of Factory Inspector in the United States (Map).....	"	"	515
Haegler's Fatigue Chart.....	"	"	524
Legal Limitation of Working Hours for Women in the United States, (Map).....	"	"	572
The American Army for Factory Inspection (Map)....	"	"	598

CONTENTS

Accident Compensation for Federal Employees—I. M. Rubinow.....	29
Accidents and Diseases, Prevention, Legislation, 1912.....	430
Reporting, Legislation, 1912.....	425
Uniform Reporting of.....	541
Administration of Labor Laws, Legislation, 1912.....	445
Air Impurities—Dusts, Fumes and Gases—Charles Baskerville.....	305
Alger, Ellice M.—Occupational Eye Diseases.....	223
American Association for Labor Legislation, Annual Business Meeting	155
Constitution	173
Meeting of General Administrative Council.....	160
Secretary's Report	163
Treasurer's Report	161
Andrews, John B.—Legal Protection for Workers in Unhealthful Trades	356
Annual Business Meeting.....	155
 Baskerville, Charles.—Air Impurities—Dusts, Fumes and Gases.....	305
Bibliography on Industrial Hygiene.....	369
Business Meeting, Annual.....	155
 <u>Cabot, Richard.—The Function of Hospitals and Clinics in the Preven-</u> <u>tion of Industrial Disease.....</u>	293
Carpenter, E. W.—The Experience of the National Employment Agency	101
Child Labor, Legislation, 1912.....	456
Classification of Occupational Diseases—W. G. Thompson.....	185
Commission on Industrial Relations, Legislation, 1912.....	465
Compensation, Accident, for Federal Employees—I. M. Rubinow.....	29
Workmen's, Constitutional Status of—Ernst Freund.....	43
Compensation of Federal Employees for Accidents and Diseases.....	559
Compressed-Air Illness—Frederick L. Keays.....	192
Compressed-Air Illness in Caisson Work—L. M. Ryan.....	350
Compulsory Reporting by Physicians—Leonard W. Hatch.....	264
Compulsory State Insurance from the Workman's Viewpoint—John H. Wallace	15
Confined Air, Effects of, upon the Health of Workers—George M. Price	312
Constitution, American Association for Labor Legislation.....	173
Constitutional Status of Workmen's Compensation—Ernst Freund.....	43
Cooperation in Promoting Industrial Hygiene,—Henry R. Seager.....	235
 Dana, Charles L.—Occupational Nervous and Mental Diseases.....	217

Discussion, Health Problems in Modern Industry.....	317
Industrial Diseases	242
Investigation of Industrial Diseases.....	281
✓Relation of State to Federal Workmen's Compensation and Insurance Legislation	60
State Promotion of Industrial Hygiene.....	363
✓Unemployment Problem in America, The.....	111
Uniform Reporting of Industrial Injuries.....	84
Diseases, Accidents and, Prevention, Legislation, 1912.....	430
Reporting, Legislation, 1912.....	425
Uniform Reporting of.....	541
Edsall, David L.—Industrial Poisoning.....	231
Education for the Prevention of Industrial Diseases—M. G. Overlock	329
Effects of Confined Air upon the Health of Workers—George M. Price	312
✓Employers' Liability, Workmen's Compensation, and Insurance, Legis- lation, 1912	467
Experience of the National Employment Exchange, The,—E. W. Car- penter	101
Eye Diseases, Occupational—Ellice M. Alger.....	223
Factories, Medical Inspection of, in Illinois—Harold K. Gibson.....	346
Temperature and Humidity in—C.-E. A. Winslow.....	297
Factories and Workshops, Legislation, 1912.....	430
Factory Inspection and Labor Law Enforcement.....	595
Federal Employees, Accident Compensation for—I. M. Rubinow.....	29
Compensation of, for Accidents and Diseases.....	559
Federal Mining Commission, A—John R. Haynes.....	140
✓Federal Workmen's Compensation and Insurance Legislation, Relation of State to,—Henry R. Seager.....	9
Fisher, Walter—Safety and Health in the Mining Industry.....	123
Fordyce, John A.—Occupational Skin Diseases.....	206
✓Freund, Ernst—Constitutional Status of Workmen's Compensation....	43
Function of Hospitals and Clinics in the Prevention of Industrial Dis- ease—Richard Cabot	293
Gibson, Harold K.—Medical Inspection of Factories in Illinois.....	346
✓Hard, William,—Unemployment as a Coming Issue.....	93
Hatch, Leonard W.—Compulsory Reporting by Physicians.....	264
Report of Special Committee on Standard Schedules.....	67
Haynes, John R.—A Federal Mining Commission.....	140
Health Problems in Modern Industry, Discussion.....	317
Henderson, C. R.—Recent Advances in the Struggle against Unemploy- ment	105
Hoffman, F. L.—Intensive Investigations in Industrial Hygiene.....	255
Holmes, J. A.—The Work of the United States Bureau of Mines.....	125
Hotchkiss, S. C.—Occupational Diseases in the Mining Industry.....	131
Hours of Labor (Men), Legislation, 1912.....	476

Immigration, Legislation, 1912.....	481
Industrial Disease, The Function of Hospitals and Clinics in the Prevention of—Richard Cabot.....	293
Industrial Diseases, Discussion.....	242
Education for the Prevention of—M. G. Overlock.....	329
Investigation of, Discussion.....	281
Industrial Hygiene, Bibliography on.....	369
Cooperation in Promoting—Henry R. Seager.....	235
Intensive Investigations in,—F. L. Hoffman.....	255
State Promotion of, Discussion.....	363
Industrial Hygiene and Safety, Investigations into.....	568
Industrial Poisoning—David L. Edsall.....	231
Industrial Relations, Commission on, Legislation, 1912.....	465
Insurance, Employers' Liability, Workmen's Compensation, and, Legislation, 1912	467
Intensive Investigations in Industrial Hygiene—F. L. Hoffman.....	255
Investigation of Industrial Diseases, Discussion.....	281
Investigations into Industrial Hygiene and Safety.....	568
 Keays, Frederick L.—Compressed-Air Illness.....	 192
 Labor Law Enforcement, Factory Inspection and.....	 595
Labor Laws, Administration of, Legislation, 1912.....	445
Lead Poisoning in New York City—Edward E. Pratt.....	273
Lead Poisoning, Protection from.....	534
Legal Protection for Workers in Unhealthful Trades—John B. Andrews	356
Legislation, 1912, Accidents and Diseases, Prevention.....	430
Accidents and Diseases, Reporting.....	425
Administration of Labor Laws.....	445
Child Labor	456
Commission on Industrial Relations.....	465
Employers' Liability, Workmen's Compensation and Insurance.....	467
Factories and Workshops.....	430
Hours of Labor (Men).....	476
Immigration	481
Mines	433
Miscellaneous	482
Pensions, Old Age.....	485
Prison Labor	486
Railroads and Street Cars.....	442
Topical Index of, by States.....	502
Trade Unions and Trade Disputes.....	488
Unemployment	490
Wages	491
Woman's Work	495
Workmen's Compensation, Employers' Liability, Insurance, and.....	467
Medical Inspection of Factories in Illinois—Harold K. Gibson.....	346

Meeting of General Administrative Council.....	160
Mental Diseases, Nervous, and, Occupational—Charles L. Dana.....	217
Mines, Legislation, 1912.....	433
United States Bureau of, Work of the—J. A. Holmes.....	125
Mining Commission, A Federal—John R. Haynes.....	140
Mining Industry, Occupational Diseases in the—S. C. Hotchkiss.....	131
Safety and Health in the—Walter Fisher.....	123
Miscellaneous Labor Legislation, 1912.....	482
Modern Industry, Health Problems in, Discussion.....	317
 Nagel, Charles—Unemployment Problem in America, The.....	91
National Employment Exchange, Experience of the—E. W. Carpenter..	101
Nervous and Mental Diseases, Occupational—Charles L. Dana.....	217
Notification of Occupational Diseases—Cressy L. Wilbur.....	339
 Occupational Diseases, Classification of—W. G. Thompson.....	185
Notification of—Cressy L. Wilbur.....	339
Occupational Diseases in the Mining Industry—S. C. Hotchkiss.....	131
Occupational Eye Diseases—Ellice M. Alger.....	223
Occupational Nervous and Mental Diseases—Charles L. Dana.....	217
Occupational Skin Diseases—John A. Fordyce.....	206
Old Age Pensions, Legislation, 1912.....	485
One Day of Rest in Seven.....	517
Overlock, M. G.—Education for the Prevention of Industrial Diseases..	329
 Pensions, Old Age, Legislation, 1912.....	485
Pratt, Edward E.—Lead Poisoning in New York City.....	273
Price, George M.—Effects of Confined Air upon the Health of Workers	312
Prison Labor, Legislation, 1912.....	486
Protection for Working Women.....	572
Protection from Lead Poisoning.....	534
 Railroads and Street Cars, Legislation, 1912.....	442
Recent Advances in the Struggle against Unemployment—C. R. Henderson	105
Relation of State to Federal Workmen's Compensation and Insurance	
Legislation—Henry R. Seager.....	9
Discussion	60
Report of Special Committee on Standard Schedules—Leonard W. Hatch	67
Reporting, Accidents and Diseases, Legislation, 1912.....	425
Reporting by Physicians, Compulsory—Leonard W. Hatch.....	264
Rest, One Day of, in Seven.....	517
Rubinow, I. M.—Accident Compensation for Federal Employees.....	29
Ryan, L. M.—Compressed-Air Illness in Caisson Work.....	350
 Safety and Health in the Mining Industry—Walter Fisher.....	123

Seager, Henry R.—Cooperation in Promoting Industrial Hygiene.....	235
Relation of State to Federal Workmen's Compensation and Insurance Legislation	9
Secretary's Report	163
Skin Diseases, Occupational—John A. Fordyce.....	206
Standard Schedules, Report of Special Committee on—Leonard W. Hatch	67
State Insurance, Compulsory, from the Workman's Viewpoint—John H. Wallace	15
State Promotion of Industrial Hygiene, Discussion.....	363
State Workmen's Compensation Legislation.....	565
Temperature and Humidity in Factories—C.-E. A. Winslow.....	297
Thompson, W. G.—Classification of Occupational Diseases.....	185
Topical Index, by States, of Labor Legislation, 1912.....	502
Trade Unions and Trade Disputes, Legislation, 1912.....	488
Treasurer's Report	161
Unemployment, Legislation, 1912.....	490
Recent Advances in the Struggle against—C. R. Henderson.....	105
Unemployment as a Coming issue—William Hard.....	93
Unemployment Problem in America, The—Charles Nagel.....	91
Discussion	111
Unhealthful Trades, Legal Protection for Workers in—John B. Andrews	356
Uniform Reporting of Accidents and Diseases.....	541
Uniform Reporting of Industrial Injuries, Discussion.....	84
Wages, Legislation, 1912.....	491
Wallace, John H.—Compulsory State Insurance from the Workman's Viewpoint	15
Wilbur, Cressy L.—Notification of Occupational Diseases.....	339
Winslow, C.-E. A.—Temperature and Humidity in Factories.....	297
Woman's Work, Legislation, 1912.....	495
Women, Working, Protection for.....	572
Work of the United States Bureau of Mines, The—J. A. Holmes.....	125
Workmen's Compensation, Constitutional Status of—Ernst Freund....	43
Employer's Liability, Insurance and, Legislation, 1912.....	467
Workmen's Compensation Legislation, State.....	565

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The Relation of State to Federal Workmen's
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AMERICAN LABOR LEGISLATION REVIEW
Vol. II, No. 1

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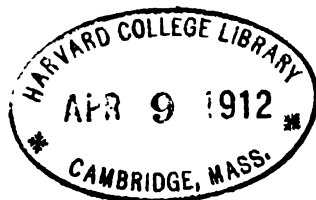
Vol II

FEBRUARY, 1912

No. 1

I. THE RELATION OF STATE TO FEDERAL WORKMEN'S COMPENSATION AND INSURANCE LEGISLATION.		
Introductory Address.....	HENRY R. SEAGER...	9
Compulsory State Insurance from the Workman's Viewpoint.....	JOHN H. WALLACE..	15
Accident Compensation for Federal Em- ployes	I. M. RUBINOW.....	29
Constitutional Status of Workmen's Compen- sation	ERNST FREUND.....	43
DISCUSSION		60
C. H. CROWNHART	GOV. NOR TEATS	MILES M. DAWSON
II. UNIFORM REPORTING OF INDUSTRIAL INJURIES.		
Report of Special Committee on Standard Schedules	LEONARD W. HATCH.	67
DISCUSSION		84
III. THE UNEMPLOYMENT PROBLEM IN AMERICA.		
Introductory Address.....	CHARLES NAGEL.....	91
Unemployment as a Coming Issue.....	WILLIAM HARD.....	93
The Experience of the National Employment Exchange	E. W. CARPENTER...	101
Recent Advances in the Struggle against Unemployment	C. R. HENDERSON...	105
DISCUSSION		111
HENRY W. FARNAM	MILES M. DAWSON	TERENCE V. POWDERLY
DARWIN MESEROLE		GOV. NOR TEATS
IV. SAFETY AND HEALTH IN THE MINING INDUSTRY.		
Introductory Address.....	WALTER FISHER.....	123
The Work of the United States Bureau of Mines	J. A. HOLMES.....	125
Occupational Diseases in the Mining In- dustry	S. C. HOTCHKISS....	131
A Federal Mining Commission.....	JOHN R. HAYNES...	140
V. PROCEEDINGS OF BUSINESS MEETINGS.		
Annual Business Meeting.....		155
Meeting of General Administrative Council.....		160
Treasurer's Report.....		161
Secretary's Report.....		163
VI. CONSTITUTION OF THE AMERICAN ASSOCIATION FOR LABOR LEGISLATION		
173		

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INTRODUCTORY NOTE

In beginning the second volume of our **REVIEW** with a report of our fifth annual meeting, it is interesting to observe a number of recent developments in the field of labor legislation.

The formation within our Association of the American Committee on Unemployment (p. 159) and the devotion of an instructive session to that growing problem, has met with the immediate encouragement of our wide-awake citizens, who, not unmindful of present evils, still hope with Alfred Mosely of London that the sad conditions brought about by unemployed labor in England may never be reproduced in this country. Intelligent Americans can no more afford to be ignorant of European experience in this matter than they can afford longer to regard the unemployed as mere material for jokes in the funny papers. An international quarterly bulletin on unemployment has been established and members of our Association can secure it upon payment of two dollars a year.

The enactment of workmen's compensation or accident insurance laws in ten different states during 1911, together with court decisions upholding the constitutionality of several of these pioneer measures, apparently establish beyond question the beginning of an important body of new law in the United States. The attendance at the session on this subject overflowed into the corridors from the convention hall, and delegates were present from as widely separated points as Boston and Seattle. A warning in regard to unjust discrimination against non-resident alien dependents was again noted (p. 158) while another resolution (p. 157) emphasized the importance of quick relief for injured federal employees.

Our legislative campaigns to secure the prohibition of poisonous phosphorus in the manufacture of matches have been effective incidentally in calling attention to that whole class of industrial injuries known as occupational diseases. A "Phossy Jaw" exhibit at our annual meeting, accompanied by the distribution of printed material on phosphorus poisoning, has aroused wide interest in the subject. Our anti-phosphorus bill as introduced by Congressman Esch (Republican) received a full hearing before the

Ways and Means Committee on January 10, and although it was referred to a secret sub-committee on January 25, public sentiment in its favor steadily increased. On February 26, Congressman Hughes (Democrat), a member of the Ways and Means Committee, reintroduced the bill, with a few slight amendments, as H. R. 20842. On March 4 the committee voted a favorable report on the Hughes (Esch) bill.

A joint session with the American Economic Association, for the consideration of safety and health in the mining industry, led to a spirited discussion of the respective obligations of miners, mine owners, and the federal bureau of mines.

The standard schedule for uniform accident reports, first drafted at our Chicago Conference last September, and improved at several subsequent conferences of experts, was put into final form (p. 67) at a joint session with the American Statistical Association. The adoption of this standard schedule by the various state bureaus of labor will mark a very great step forward in American accident statistics. The committee having the matter in charge will soon issue a special announcement including suggestions for the use of the accident blank as well as the draft of a bill for a standard accident reporting law.

The enactment last year of our bill requiring physicians to report occupational diseases, in six different states, has given a decided impetus to the study of industrial hygiene. A tentative draft of a schedule for the use of physicians in reporting occupational diseases was distributed at our annual meeting for criticism. The committee was instructed to submit a revised draft of this blank for further discussion at our Second National Conference on Industrial Diseases, which will be held in Atlantic City, N. J., June 3-5, 1912.

JOHN B. ANDREWS, Secretary
American Association for Labor Legislation.

I

THE RELATION OF STATE TO FEDERAL WORKMEN'S
COMPENSATION AND INSURANCE LEGISLATION

THURSDAY EVENING SESSION, DECEMBER 28, 1911.

Presiding Officer: HENRY R. SEAGER
President, American Association for Labor Legislation.
METROPOLITAN TOWER, NEW YORK CITY.

INTRODUCTORY ADDRESS

HENRY ROGERS SEAGER

President, American Association for Labor Legislation.

In opening this, our fifth annual meeting, I cannot refrain from saying something about the progress that our Association has made during the past year. This progress has consisted less in labor legislation achieved than in the building up of our organization and the preparing of the way, through careful study and the dissemination of accurate information, for labor legislation to be achieved in the future. Thus in the national field neither of the measures which we have advocated, the Esch Bill imposing a prohibitive tax on poisonous phosphorus matches and a bill creating a Federal Commission for the Study of Industrial Diseases, has been passed; but there has been developed, largely through our efforts, a nation-wide interest in both proposals that must in time bear fruit. The Ways and Means Committee has appointed January 10th for a hearing on the Esch Bill and we are very hopeful that this hearing may lead to legislation that will free this country from the disgrace of fostering a loathsome disease proved by foreign experience to be entirely needless. There is no such immediate prospect of an Industrial Diseases Commission, but the Second Conference on Industrial Hygiene which we are planning to hold in New York City in the spring cannot fail to bring this project also much nearer actual realization.

In the field of state legislation our achievements have been more substantial. Our Review of Labor Legislation for 1911 has expanded from the thin pamphlet of 1910 into a stout monograph of over one hundred and fifty pages. For most of this legislation our Association can claim no credit. It has been the result of widespread dissatisfaction with labor conditions and of a growing conviction that at many points the lot of the American wage-earner can be and ought to be made better through legislation. Some of it, however, like the laws passed by six of the states requiring certain industrial diseases to be reported, has been secured directly through our efforts. Much more of it has come in consequence of state campaigns in which our members have taken a prominent part.

Quite as important as this positive achievement has been our negative work of opposing and defeating unwise labor regulations. In the New York Association, with whose legislative work I am more intimately acquainted than with that of our other branches, two labor bills are opposed for every one that is supported. No one who has not studied in detail the labor bills presented during a session of one of our state legislatures, can imagine the crudity and futility of many of the measures that are introduced. Most of these are born in ignorance, but sometimes there lies behind them a more sinister explanation. To subject these bills to critical analysis and bring about their defeat is as much the purpose of this Association as to promote wise legislation.

From the point of view of the expenditure of time and money which it necessitates, the legislative work of the Association is decidedly less important than the educational. The principal forward step in our educational work made this year was the substitution for the irregular publications of the previous years, of the *American Labor Legislation Review* (Quarterly). The four numbers of this review issued in 1911 make a volume of nearly six hundred pages of interesting and timely information on labor legislation in the United States. These reviews, supplemented by Dr. Andrews' monthly departments in the *Survey*, are coming to be relied upon by an ever widening circle of readers as the most up-to-date and reliable sources of information touching the whole range of topics with which we are concerned.

To maintain our legislative and educational work, money is needed and the last indication of our progress to which I must call your attention has to do with our income and expenditures. At our meeting in St. Louis a year ago the minimum dues were advanced from one dollar to three dollars. As we anticipated, this change made a very serious inroad into our membership. Notwithstanding all of our efforts nearly seven hundred of our old members have failed to respond to Dr. Andrew's urgent requests for a continuance of their support. As his report to be presented at our business meeting in the morning will show, however, we have more than made up for this serious loss in membership by additions to our ranks. We thus close the year with the largest membership in our history.

In consequence of the increased dues paid by an enlarged membership and a vigorous campaign for special contributions, our total

receipts from members contributing less than \$100 each to our treasury have almost doubled, while our receipts from contributors of \$100 or more each have more than doubled. I hope that it will not be inferred from this that we are rolling in money. Quite the contrary. Our activities have increased so rapidly that we shall close the year with a negligible balance in the treasury and with a well thought program of work for 1912 that will call for an expenditure of about \$30,000 as compared with the \$20,000 that we have secured and expended in 1911. We need more than at any time in our history the active and generous support of all those who believe in reasonable labor laws rigidly enforced.

* * * * *

At this meeting, as at most of our previous meetings and conferences, the subject of workmen's compensation and insurance legislation occupies a foremost place. I do not wish to anticipate the distinguished speakers who will deal with different phases of this broad subject, but it seems appropriate that I should introduce the discussion by saying something about the relation between federal and state legislation in this field. Of state legislation we have had a goodly grist in the last two years. Thirteen states have passed more or less complete compensation or insurance laws, and of these only two, the laws of New York and Montana, have thus far been set aside by the courts as unconstitutional. Those who consider it a great advantage of our federal system that it offers a wide field for experimental legislation must view the laws that have been passed with satisfaction. They present nearly every possible method of dealing with the compensation problem, from compulsory compensation without insurance through all the gradations to straight state insurance. The unanimity of opinion that has developed from the study that we have thus far given to this problem was well illustrated by the experience of the Massachusetts commission. In answer to the question whether their report had been unanimous, one of the members of that commission said to me with fine irony: "Oh yes, we were unanimous! There were five of us on the commission. One was in Europe and could not submit a report, three of us turned in separate reports, and the other dissented from all our views but was unable to get his own ideas worked out into a plan in time to submit them to the legislature!"

Valuable as these diverse legislative experiments must prove to

future generations, they involve serious hardship on contemporaneous enterprise. It is said that in consequence of the New Jersey act the rates for employers' liability insurance in some trades are in Camden, New Jersey, just ten times the rates employers in those trades must pay across the river in Philadelphia. Such a situation is only tolerable on the assumption that it is a passing phase in the general movement toward the adoption of the new system by the whole country.

Impressed by the difficulty of securing uniform state compensation laws, some students of the subject have looked for relief to the federal government. Mr. Dawson, who has promised to take part in the discussion this evening, has urged upon the federal commission the adoption of a federal accident insurance law which shall apply the best features of the German compulsory insurance system to our American industries generally.

No one who has studied the operation of the German system can fail to be impressed by its advantages. The ideal which inspired the German statesmen of the eighties and which inspires Lloyd-George and his associates in England today, is a splendid one. It is to do away with that large proportion of poverty that is directly traceable to industrial accidents, illness, unemployment, old age, and premature death by protecting those liable to it through a comprehensive system of social insurance. This ideal of substituting order and regulation through obligatory insurance for the chaos growing out of our unbridled individualism must appeal to all of us with a forward look. In our enthusiasm for it as a goal toward which to work, we must not, however, underrate the difficulties to be overcome or the dangers to be avoided before we can achieve it.

The severe arraignment which Dr. Ferdinand Friedensburg, a former president of the senate of the German Imperial Insurance Office, has recently brought against the whole German system of workingmen's insurance emphasizes some of those difficulties and dangers. While his strictures no doubt betray, as Dr. Zacher has declared, "an unwarranted tendency to condemn a great national social insurance system on account of a few shortcomings in some of its details," they yet are the conclusions of a well-informed German observer for whose "sense of justice and fairness" Dr. Zacher himself expresses "the highest regard." The conclusion to be drawn from them is not that the German system is unsound, but

rather that in the working out of that system serious mistakes have been made, mistakes in administration rather than in legislation, and that such mistakes will inevitably be made unless every development of the policy is preceded by laborious thought and study. The Germans will no doubt correct their mistakes. Unless we are to make worse ones, however, we must be content to make haste slowly in this for us still new field of legislation.

For this reason and not because my imagination is not also quickened by Mr. Dawson's ideal, I cannot refrain from expressing satisfaction that the federal commission has finally decided to confine itself to the more modest task of recommending a simple compensation law for the employes of interstate railroads. The tentative bill that has been prepared by the commission has many admirable features. More than half of it is addressed to the task of substituting a simple plan of arbitration for the settlement of questions that may arise under the law, for ordinary court procedure. This seems to have been well thought out and, since the act will apply only to interstate railroads which deal directly with their employes in accident cases without the intermediary of the employers' liability insurance companies, should operate to the satisfaction of both parties. This is the more probable because the compensation system provided is to be exclusive and because the scale of compensation proposed is so moderate that the railroads may well be expected to adopt a conciliatory, not to say liberal policy in the settlement of claims.

The one feature of the new system that seems to be seriously objectionable is the limitation of the compensation to be paid to the non-resident widow or dependent child of an employe who is killed by an industrial accident to one year's wages, and the exclusion of other non-resident dependents of a deceased workman from any compensation whatever. Such a policy is opposed to the general trend of foreign compensation laws, is unjust and ungenerous, and has the practical disadvantage of putting a premium on the employment of aliens whose families reside abroad to the exclusion of American workmen. No doubt the equal treatment of non-resident dependents of deceased employes presents administrative difficulties, but foreign experience proves that these may be overcome. This Association has already declared itself opposed to this species of discrimination in connection with state legislation and should protest against its inclusion in the proposed federal law.

Much more significant and important than any of the details of this proposed federal act is that it is recommended as a compulsory law. If Congress can be brought to pass a law which shall present squarely to the federal courts the question whether the compensation principle can be introduced into our system without violating the due process requirement, an important step will have been taken toward removing the constitutional difficulty that has thus far been a serious stumbling block.

Taken all in all, the tentative bill drafted by the federal commission is an important contribution. It is only one of numerous evidences of the intelligence and ability which the members of this commission have brought to their task. As their hearings, published with commendable despatch and widely circulated, have helped to educate public opinion on this whole subject more than could the hearings of any state commission, so the serious discussion of this bill in Congress must lead to further enlightenment. There seems good reason to hope that from it will emerge a federal compensation law that may serve as a useful model for state legislation and give an impetus to the movement toward uniformity, which has thus far been sadly lacking except in academic discussions of the problem.

Among the compensation systems that have been adopted by different states, none has dealt with the problem more comprehensively or fearlessly than that of the state of Washington. We have the privilege of having with us this evening the Honorable John H. Wallace, a member of the Washington State Industrial Insurance Commission, who will tell us about the Washington system.

COMPULSORY STATE INSURANCE FROM THE WORKMAN'S VIEWPOINT

JOHN H. WALLACE

Member, Industrial Insurance Commission of Washington.

It has been said that so long as the workman receives compensation for work accidents, he is not concerned with the source of the money, that he cares not whether the employer goes bankrupt paying the bill, whether insurance corporations assume the indebtedness, or whether it is paid out of a common fund contributed by all the industries. The attitude of the workman in the state of Washington, in the formation and final passage by the legislature of our compensation act, must tend to disprove this statement. The members of the American Association for Labor Legislation are familiar with the text of the act passed in my state. Other members of the Washington commission have explained to some of you the salient points. As members of a national organization concerned with procuring for the American states the best system of compensation possible to replace the slow, unjust and obsolete common law procedure, you will be interested in the unique system of Washington, in formation and in process of administration, as viewed by the working people who are the beneficiaries.

I. WORKINGMEN UNDER THE COMMON LAW

It is unnecessary for me to point out to this body the universal experience of working people under the so-called common law system. Able investigators have conclusively demonstrated that not to exceed 15 per cent of the men injured in work accidents could obtain compensation under the old system, leaving the heaviest burden in modern life to fall on the weakest members of society in 85 per cent of such cases. Not only this, but the funds paid out by employers to protect themselves against excessive verdicts, if not all verdicts, have been largely wasted—from the workman's viewpoint. Not less than one million dollars a year in each great industrial state was paid out by employers. Not more than 20 or 25 per cent

reached the working people in the 15 per cent class entitled to compensation heretofore under the old system. This situation clearly demonstrates that where some few may have obtained heavy damages, the vast majority were left as charges upon society, or to bear their burden alone with the best courage their crippled condition permitted.

The president of the United States Casualty Company, in a widely circulated address opposing state insurance, solicits condolence because, as he shows for five-year periods, the insistence of juries that damages be paid injured men has compelled casualty companies to disburse over 50 per cent of their premiums received. This means that less than 25 per cent of the premiums collected have reached the victims of accidents (the other 25 per cent being eaten up in attorneys' fees, court costs, time lost and expense in going to lawyers), as against the 100 per cent of premiums going to injured workmen where the state insures employees against industrial accidents.

Casualty companies, with their liking for litigation and their limitation of protection to \$5,000, except with double or quadruple premiums, have not afforded protection to the many young industries endeavoring to get a foothold in our undeveloped state, and we were not sure that a system which would practically compel all employers to insure with these companies would protect the injured workman against irresponsible, bankrupt or absconding employers who had lapsed their policies or violated some technical requirement in the same. The establishment of a state fund rests on the insurance principle of distribution of risk—that one employer should not bear alone the exceptional stroke of bad luck.

Economically the old system is wholly indefensible because of the waste of 75 or 80 per cent of the funds taken out of industry to repair the man-loss thereof—a waste absorbed by lawyers, by commissions paid for placing insurance policies, by executive salaries of numerous insurance corporations, by duplicated clerical forces, by dividends to clamorous stockholders of such companies, by claim-agents who sought advancement through a record of elimination of claims and of contemptible settlements, by unnecessary witness fees and court costs, by the maintenance of a machinery of appeals, and by the multiplication of judges necessary to hear such lawsuits, both meritorious and born of fraud. The magnitude of this litiga-

tion, which necessarily arouses class antagonism, recrimination and bitterness, has also contributed in no small way to the restlessness of the working class caused by the delays of justice, and to the criticism of the courts as institutions. It is useless to say to this body that the system so characterized is universally condemned, and the only question which arises in the minds of thinking people is, what is the best system to replace it?

In the state of Washington the workmen have contributed their full share of time and thought and coöperation in evolving a system which, we think, is in most respects superior to any piece of compensation legislation in the United States. To quote Mr. Robert W. Bruere in the October *Harper's Monthly*, "One state, Washington, honoring the liberal spirit of the West, has inaugurated a system of compulsory state insurance against industrial accidents which for comprehensive justice and social wisdom compares favorably with the most advanced legislation in Europe".

An able corporation lawyer of Spokane had in a previous legislature submitted a compensation bill under the elective plan, which provided a maximum of \$3,000 in event of death. This bill, not having the endorsement of either the employers or the workmen of the state, got scant consideration at the hands of the legislature in 1909.

The Tacoma Commercial Club, in August, 1910, at a time when the United Mine Workers were in convention in Seattle, issued a call for a meeting of manufacturers and labor men of the state to discuss some form of remedial legislation.

II. THE INVESTIGATION COMMISSION

As might have been anticipated, neither the representatives of capital nor of labor came into the meeting with any concrete program, yet as a result the governor of the state, Honorable M. E. Hay, was empowered to appoint an investigating commission of ten members, five representing the employers and five the employees. On September 29th, 1910, the commission so appointed organized and secured the services of Harold Preston of Seattle, a profound student of industrial problems and one of the ablest constitutional lawyers in the Pacific Northwest, as its legal adviser.

While the sessions of this commission were often heated and the interests represented not always harmonious, yet it must be said

that the prompt, courageous, remedial legislation which was born in this commission was made possible by the fact that in this new northwestern state are to be found, not only big, generous employers who were disgusted with the legal system surrounding them and who often drew large checks, not in charity but in justice, to compensate the men in their employ or their dependents; but likewise, among the working people of the state, the youngest and best blood of this continent and of Europe,—brave spirits who left the old home conditions to become full blown men in a new land of opportunity and to do their part in obtaining justice for themselves and their fellows,—the same mingling of stocks which we find in the early settlement of the Atlantic Coast, building a people that, we believe, represent the very flower of civilized mankind.

This body will be interested in the contested questions before the commission. The limitation of the amount to be paid in event of death was one of these, and resulted in the adoption of the principle that \$4,000 to a beneficiary aged thirty years would be a reserve that would guarantee a pension throughout life or dependency and insure the self respect and good citizenship,—insure the grocery bill, if you please,—of all survivors, most of whom heretofore had been obliged to lower their standard of living, if not to accept the bitter bread of public or private charity. In other words, the principle adopted in the state of Washington is not the damage measured by the earning power of the workman killed or permanently disabled, but the insuring of a monthly payment to one who in the front ranks of industry has gone down before the flying shafts, whirring saws, munching cogs, smothering gases or falls of rock, and stands before society a crippled and deserving veteran. Heretofore governments have gladly pensioned the young soldier injured in the course of duty in defending hearth and home, or in righting insufferable wrongs abroad. The working people, at least, now insist that the soldier of peace, also obeying the commands of society, —who produces clothing for the body or food for the blood, or a roof for the household,—shall also be pensioned when mangled, maimed or dismembered by the machinery that moves with nerves of steel and fingers of brass, so gigantic and elemental that flesh and bone are as nothing in its power.

The commission, therefore, with one accord agreed on the principle that lump sum payments to helpless survivors should rarely

be given. At its discretion, however, the commission has ample power to pay off a mortgage on a widow's home or advance money to permanently cure a crippled child,—in other words, to commute a portion or all of the reserve fund set aside for the survivors' use into a lump sum payment. The scale of payment for partial disability was graduated down from \$1,500 maximum, the compensation for the loss of the major arm.

III. FIRST AID FUND

The principle of a fund as a buffer, for first aid to the injured, was recognized by the commission on the insistence of Labor's representatives. The following sections are taken from the draft presented by the commission to the legislature:

Sec. 10. *Creation of First Aid Fund.*

A fund is hereby created in the state treasury to be known as the First Aid Fund. Into it shall be paid by each employer, on or before the fifteenth day of November, 1911, and each month thereafter, the sum of four cents for each day's work or fraction thereof done by each workman for him during the preceding calendar month or part thereof. Two cents of such four cents shall be deducted by the employer from the pay of the workman.

Sec. 11. *Disbursements of First Aid Fund.*

Upon the occurrence of any injury to a workman, he shall receive from the First Aid Fund proper and necessary medical, surgical and hospital services and compensation for the period of temporary or other disability in the sum of five dollars per week, for not to exceed three weeks, payable at the end of each week. It shall be the duty of the employer to see to it that immediate medical and surgical services are rendered, and transportation to hospital provided, and all charges therefore shall be audited and paid and be payable only by the department out of the First Aid Fund.

In the first aid the principle of joint contribution by employer and workman was approved, and the amount, four cents a day, equally divided, approximates the payment of \$1 per month, the usual contribution to hospital funds in the lumbering and coal mining industries in our state. The payment for ambulances, physicians, hospital treatment and surgical appliances, limited to three weeks and to \$5 per week, was designed to prevent simulation and fraud upon the state, as well as to secure that instant attention to the injured on which humanity insists.

Labor opposed joint contribution to the fund further and other

than first aid, for the reason that the employer owns and operates the dangerous agencies for his own profit and has heretofore contributed to the man-loss resulting from such dangerous agencies, so far as compelled to, by payments to casualty companies or through the channels of the courts,—in many instances both, since the usual limit of protection in a casualty policy is \$5,000 and the amounts claimed in lawsuits tend to greatly exceed that sum. The employer, so far as allowed by competition, and if not bankrupted by a sympathetic jury, has passed these charges on to the public, along with the depreciation of machinery and plant, in the price of the product. Labor saw no injustice in providing that the buying public should pay for broken men in the industry as well as for broken machinery, the equivalent paid out and wasted heretofore being now turned into legitimate channels for the actual sufferers of the industrial system. In either event the public must pay the price, if not in the product then in institutions of relief or in charity's grudging doles.

In the fixing of rates according to the presumed hazard of the occupations regarded as extra hazardous, the commission was guided by an actuary of long casualty experience. In the lumbering industry, for instance, \$1.50 per \$100 was the average rate charged on insurance policies. One per cent more was added, making the state rate \$2.50. The term "extra hazardous" in the Washington draft and law was inserted out of fear of constitutional objections otherwise, but any employer outside the law may voluntarily bring his business under its terms by joint agreement with his employees.

IV. IN THE LEGISLATURE

The bill, as approved by the commission, reached the legislature as one of the leading measures of the administration of Governor Hay, and its passage was widely advocated and as vigorously opposed, particularly in the state senate, where various other bills were proposed to protect particular interests, or to promote the pet schemes or advance the political fortunes of certain senators. As the bill emerged into law the first aid feature was stricken out. It was opposed through fear that state supervision of hospital treatment would result in the upbuilding of a political machine for administration and in the location and construction of state-built hospitals; it was opposed as abolishing hospital funds in remote logging

camps where a resident physician is commonly retained on salary to look after not only accidents, but sickness and family ills as well; it was opposed also because the deduction from wages operated to take a heavy percentage out of earnings of low paid employees; and lastly it was opposed because it was argued that this was a daring piece of social legislation and would be sufficiently cumbrous for the first two years of its experimentation without the burden of the first aid feature and the close supervision and weekly payment of bills required. In the discussions one representative, from a district devoted largely to logging and lumbering interests, insisted that the state, with its slow, incompetent and bureaucratic tendencies, could not give men the paternal care which the corporations were now efficiently supplying. To this Representative Teats, a Tacoma lawyer who had built up a fortune as a damage case specialist and who handled the measure in the house, replied that unquestionably the first aid feature would interfere with a well known corporation graft whereby men were kept in constant rotation in order to obtain from them a hospital fee—a deduction of \$1 per man. Working in conjunction with the so-called employment agencies, he said, they kept three crews constantly moving—one crew coming, one crew leaving and one at work—\$1 a head collected from five or six crews each thirty days.

While in the legislature the bill was improved in two important particulars. Owing to the objections against a huge fund being taken out of the industries of the state and piled up in the state treasury by the continuous compulsory payment of a flat rate on the payrolls, the legislature provided first that, instead of one common accident fund for all employers, with men in all degrees of hazard, there should be established forty-seven funds representing forty-seven compulsory associations of employers. Related industries are grouped together and the opportunities for criticism of particular establishments and for mutual steps toward prevention of accidents are thereby greatly increased. For instance, Class 10 embraces only employers engaged in logging operations, saw mills, shingle mills, etc., Class 14 only street railways, Class 16 coal mines, etc. Already the lumbering organization is looking forward to standardizing plants and machinery in order to prevent accidents and save its members money. Under our law the fewer the accidents in any class the smaller the amount which those particular employers

must contribute. The state pays the expense of administration out of general taxes. Secondly, provision is made in the law as enacted that whenever any one of the forty-seven groups of employers has sufficient funds on hand to care for the accidents of its particular class, no further sums will be assessed until the fund is reasonably depleted by the drain of compensatory payments.

Other than the changes just enumerated, the bill passed our legislature as recommended by the investigating commission. A handsome majority was given in the house, but in the senate, owing to the attitude of senators with bills of their own, all the resources of the governor were called upon to obtain the two votes needed to pass the measure. Some of these lawyer-senators saw no further into social needs than the limitation of lawyers' fees in damage cases to 10 or 25 per cent of the verdict. At this point the remarkable speech of Peter Henretty, a coal miner from Cle Elum, on the floor of the senate, probably did more than any other one thing in compelling the passage of the law to compensate injured workmen.

V. THE LAW IN OPERATION

The Workmen's Compensation Act was passed and signed by Governor Hay on March 14th, 1911; the three members of the administrative commission were appointed; and the new department was organized on June 8th, 1911. Beginning July 1st, the commission procured the services of about twenty men as traveling auditors and began a preliminary survey of the state to ascertain the industries within the scope of the law. It was gratifying that in this first contact not less than 90 per cent of the employers were found to be in the most hearty accord with the law, gladly giving every courtesy and the heartiest coöperation to the agents of the commission, and that they remitted about \$400,000 on approximately 4,000 payrolls. The state-wide feeling of employers was that this law, dispensing with middlemen and with court processes, enabled the man hurt to receive one hundred cents on the dollar paid out for such purpose by the employer. Suggestive of this attitude is a statement by one of the largest employers of labor in the city of Spokane, who, when the question arose as to whether this system would not increase the rate of insurance, said: "What if the rates are a little higher so long as the benefits go directly to the injured employe or his dependents and tend to a better feeling between employer and employe?"

The employers were quite unfamiliar with the break-up of the accident fund into forty-seven groups, but were gratified to learn that they were classed with employers of their own kind and yet in groups sufficiently large to give effect to the insurance principle of distributing the risk and not bankrupting the establishment that might have a series of accidents. Administratively the division of the plant into extra hazardous and non-hazardous departments constituted a vexatious problem, but the commission's attitude in treating the plant as a unit and including all employes therein was generally approved.

Another problem is the twilight zone between state and federal jurisdiction in interstate commerce, as applied to steamboats on Puget Sound and on the Columbia River, state boundary bridges and various railway operations, Alaska fishing boats with canning establishments in the state of Washington, and stevedores and longshoremen loading and unloading ocean carriers under admiralty jurisdiction. It is certainly to be hoped that Congress in its forthcoming legislation will so dovetail with state activities that compensation will be sure, and the process of obtaining it rendered certain as between state and federal courts or systems.

The problem of contractors is also vexatious, for they jump in their operations from one class to another, with big jobs or small jobs or no jobs at all,—in many instances without offices or records,—now employed by municipalities and now by private citizens. The contractor erecting a forty-two story building in Seattle and also the one employing two men building a chicken-coop, who may fall from a trestle and claim state compensation, are embraced under the law. These items suggest the complexity of administrative detail.

The rates are tentative, subject to future adjustment, not by the commission, however, but by the legislature. A rate of 2.5 per cent for sawmill employes is apparently yielding ample funds for their protection; but with a rate of 5 per cent placed on brick work and 3.5 per cent on "carpenter work not otherwise specified" it remains to be seen whether inequalities are not present to be worked out and remedied by the legislature with the aid and advice of the present commission.

Rates in the state of Washington, while apparently fixed by the text of the law, are, in fact, automatically adjustable, at least to the

accidents which occur in all continuously operating classes. In the contractor classes, equity between competitors seems to demand continuous monthly payments until the legislature revises construction rates. And the employers of my state have been marvelously fruitful in suggesting variations in rates and reasons therefor,—often unmindful of the fact that a small class is a dangerous one for an individual employer to be in. For instance, take the powder class where eight girls, from fourteen to twenty-one, were instantly killed on November 1st, requiring a fund to be set aside amounting to about \$8,000 to insure the monthly payments to their parents. Only four powder plants, all but one very small, operate in the state of Washington. These plants, by reason of that accident, have witnessed their joint fund more than absorbed, leaving a deficit to be made up at the end of this year,—a condition which applies to any class at the end of any year where a deficit at the present rate results.

On this question of rates, it does not follow that casualty companies' rates heretofore represent the real hazard—rather “what the traffic will bear”. Two sawmills of the same company operating within a short distance of each other illustrate my point. With no apparent difference in hazard, one plant paid \$1.35 and the other \$1.50 per \$100 of payroll. We are not convinced in Washington that the casualty companies' experience at the present time will give any adequate standard of rates. They refused to give to the public figures which their actuaries had already compiled, but in their experience they dealt with only 15 to 20 per cent of the injuries chargeable to industry. We are not sure that our state department is not as competent to find correct rates by experimentation as they are. Four times in one year in Seattle they changed the rates on automobile insurance. (Under our Washington law we adjust the rate each month by making an assessment or passing the opportunity up.) This is recognized by the companies themselves, for Actuary Wolfe, in a widely circulated address, recommends state control of rates as a cure for evils admittedly existing in these companies.

The business interests of the state, always jealous of the drain of funds to Wall Street or other eastern localities, are pleased with the principle of home rule of compensation funds. Says Governor Hay:

"Out of \$600,000 collected from the employers of the state of Washington in 1909, only \$100,000 ever reached the injured workman or his family—half a million dollars drawn from the avenues of commerce and industry to pay an army of officers, agents and adjusters of the liability companies and to line the pockets of the stockholders whose only interest is that of a dollar and cent proposition".

Administratively the absence of the first aid feature has, of course, raised problems. Employers whose injured men have heretofore been sent to the hospital with first aid paid for by casualty companies now find that the state gives no relief except by the payment within thirty days, in part or in full, to the workman on account of the injury; and in some cases the attending physicians and city hospitals are reported not to give the best care and attention to injured workmen, which, of course, means ultimately an unnecessary burden upon the class to which their employers belong.

VI. TWO MONTHS OF ACCIDENT EXPERIENCE

Opponents of compulsory state insurance point out as the two greatest weaknesses of the system, first that it does not operate effectively in preventing accidents, and second that it does operate unfairly in grouping together employers whose establishments represent great differences in danger to the employees. Affirmatively, the Washington state system endeavors to check accidents. First, there is a penal increase of rates applied to any establishment where accidents for a sufficient period show careless management, defective or obsolete machinery. Secondly, the law also penalizes the violation of safeguarding statutes and the employment of children under working age by requiring the employer to pay into the fund as penalty 50 per cent of the amount which the law allows the victim.

The present commission is in contact and coöperation with the State University and the State Industrial College, to obtain special studies in the causes of accidents and university extension lectures on methods and appliances for safeguarding. From this work we anticipate large results, since it must be evident that employers will desire to save money rather than have accidents. In many instances all they need is education.

Mr. Tecumseh Sherman, former labor commissioner of the state of New York, is much concerned for fear state bureaus will either be unable to afford as prompt compensation as individual firms or

casualty companies could or, if they do act with speed, will do so with a paternal indulgence that must cripple industries or seriously burden the general taxpayer who maintains the inspection officials. We feel that it is not proved that the state cannot procure as competent employes as casualty companies, since we have been able to obtain in our service in Washington some of the best trained and most ambitious claim agents and auditors heretofore connected with casualty corporations in the state. In our state, moreover, where establishments, big and little, are peculiarly anxious that their competitors pay equally with themselves, the compulsory associations of employers are prolific in suggestions, and are ready for the voluntary associations looking to standardization and accident prevention which this commission will be active in getting organized.

Mr. Sherman does not like the Washington law because the compensation is not measured in all cases by the wage. But we in Washington did not like Mr. Sherman's New York law, which provided a payment to a widow of a sum equal to four years' wages of her husband, in no case to exceed \$3,000, which she might dissipate in her ignorance of financial pitfalls. Nor did we like the provision of the New York law that a workman totally disabled should receive a weekly payment not to exceed \$10 nor to extend more than eight years from the date of the injury, leaving the widow, or the blind workman, in old age, a helpless charge on public or private charity, and depriving the child of its legitimate birthright. Under our Washington law the first care has been that the child of the present shall have an opportunity to be a good citizen of the future.

Mr. Sherman, in his memorial to the congressional commission, insists that the excess paid by the good employer appears to give gratuitous insurance to the escaping firm. We must grant that our administrative problem is difficult as to the intermittent or alien contractor, the dummy corporation, the tramp ship and the elusive little shop. But we believe that our system will catch such employers as readily as the casualty company, because the man hurt will come to the state for compensation and the employer must then deal with our department. If he refuses, we reach him with summary process, with civil suit in the name of the state, with criminal procedure, or with all three.

Our law is criticised as merely an insurance against destitution, and we grant the charge as to the widow and her flock, or as to

the sightless or armless victim of a bloody misfortune of peace. Our law does give compensation in other cases. Perhaps it is fair to the employer to say that no workman has any assurance that he will continue to earn his present wage for eight years or one year; but every workman is entitled to the assurance that he shall not starve in civilized society if rendered unable to labor, and that his helpless dependents shall not be driven to charity, or worse. Our law provides for a monthly payment of from \$20 to \$52.50 to a workman temporarily totally disabled, providing such payment does not exceed 60 per cent of his wages; and our compensation scale for permanent partial disability runs from \$1,500 for the loss of a major arm at or above the elbow and \$1,250 for the loss of one eye or of a hand at the wrist, down to \$25 for the loss of the little toe or of the first joint of the little finger. Furthermore, we see no reason why, as a matter of public policy, the state should not encourage a skilled workman with large earning power to provide private insurance for his family, by making him familiar with the maximum allowed by the state in the event of his death or disability.

Mr. Sherman believes that state commissions would allow exaggerated and doubtful claims to please the working people. In Washington, however, the commission, with the maximum laid down by the legislature, has prepared a scale for practically all injuries, based on scientific information obtained from reports of the Surgeon-General of the United States Army, standard texts and one hundred detailed schedules from eminent surgeons throughout the United States. The practice of the present commission is to allow no claim until the employer, the claimant, the physician and the witnesses have all made detailed reports. In case of doubt the nearest agent is ordered to make a special investigation. In case of continuing disability, condition reports from the physician or employer are required to check simulation, fraud and error.

The legal theory in Washington is that the sovereign state practically licenses these dangerous agencies which operate for profit, requiring from all operating them such a degree of care that no one shall cause an accident; and further requiring that, if accidents do happen, as we know they must, the employer shall pay into a guaranty fund to care for the victims. And we believe that the Supreme Court of the United States, when it comes to this question, will find

that the public welfare demands this legislation more imperatively than it demands contributions by banks to protect depositors.

The first two months of experience seem to show about six hundred accidents per month, varying from loss of life and total permanent disability down to trivial bumps and bruises and even torn trousers. The statistics now presented must be regarded by this body as purely tentative and not as the finished tables of systematic statistical investigation.

In closing, gentlemen of the Labor Legislation Association, as a citizen of one of the newest and most virile states of the American sisterhood, as a workman almost born in the mines of England and a graduate of the child labor system of the mines of Pennsylvania, as an operative in and about the coal mines of Washington for ten years, and as one who has been honored with the privilege of representing organized labor on various occasions and for considerable periods, I point with pride, as an old phrase goes, to my magnificent state that, without cowardice and without hypocrisy, threw aside all fetters of ancient custom, entangling legal verbiage and hide-bound decisions, and enacted a law, not in charity and not in malice, but in justice to every man who invests his brain or his brawn in developing the resources of the commonwealth. And in so doing the workmen of the state and the employers thereof are not unmindful of the greatness which must come to this state and to its people. The Panama Canal will bring ships and products, not only from the Atlantic seaboard but from abroad, with steerage cargoes of wistful-eyed men from all sections of Europe searching for work in a new land. We are tributary to the undeveloped empire of Alaska, and the front door to the millions of the Orient. We are providing for that industrial empire on the western edge of the continent which is yet in its infancy. We are not unmindful of the magnificent mountains that surround the valleys and the inland sea of Puget Sound, from which leap white torrents with the harnessed energy of a million wild horses, sufficient for the turning of countless wheels that will grind and maim and dismember men unless such dangerous agencies are so operated that accidents will be reduced to the minimum. And we are not evading full responsibility that human beings who have given all that God gave them to the service of mankind shall be compensated for their mite offering, even though they be known by number and are of that class which have heretofore been termed "just wopps."

ACCIDENT COMPENSATION FOR FEDERAL EMPLOYEES

I. M. RUBINOW

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When the act of May 30th, 1908, was passed, granting compensation for injuries sustained in the course of employment by certain employes of the United States, it was hailed as the first important victory, the first milestone on the road to scientific compensation legislation. Barring the ill-fated Maryland act of 1902, conceived in ignorance and quickly forgotten, this indeed was the first act which not only proclaimed the word "compensation" in its title, but also embodied at least some elements of the compensation principle. To the legislators in Congress it may have been only an effort to do a mite of justice to the government employes who under the statutes had absolutely no redress and, therefore, were in a position infinitely worse than were private employes even at the time; but to those who worked and hoped for a day when efficient and just compensation laws would sweep aside all of the complex and wasteful structure of liability legislation—to us it meant a good deal more. The situation has changed so much since then that one can approach an analysis of this law in an entirely different spirit. When about twelve states have passed various compensation and accident insurance laws, we can study the federal compensation act simply as a piece of legislation and not as a piece of propaganda, so as to be able to find out how satisfactory are the conditions under which a fairly large number of industrial employes of the United States government may expect their compensation in case of industrial injury.

It is somewhat unfortunate that, though the act has been in force three years, as yet no report of its application has been published by the department administering it. When published, the report promises to be an interesting and valuable contribution to our literature on accident statistics and compensation. In the annual report of the Secretary of Commerce and Labor for 1909 we read: "In order that full data may be available in regard to accidents to

all classes of employes, regulations have been issued requiring a report to the department of all injuries to government employes. It is believed that in a comparatively short time the statistics of such accidents will be of considerable general value aside from their bearing upon legislation to enlarge the scope of the law." It is well known how limited and unsatisfactory are as yet our American accident statistics. While several states have made praiseworthy efforts to make special studies, European experience has clearly demonstrated that in the absence of compensation laws accident statistics are bound to be of doubtful value. As yet the volume of experience collected by the federal government in connection with this act is the only valuable experience obtainable in this country. While it applies to a limited number of employes, it still presents a tangible basis of calculation of compensation costs, in a few important industries at least, such as large construction operations, machine shops, navy yards, etc. As such it will be of great value, not only to the legislators, but to our various state compensation commissions, and also to private accident insurance companies; and, by means of a display of some actuarial ingenuity, it may extend its usefulness over other branches of industry as well.

But even before these data are published, the act of 1908 may be carefully studied on the basis of its legal provisions, as well as of the personal experiences gained in its application, both in the office and in the field, in the investigation of special claims; for in this way its shortcomings, as well as the general problems arising out of the administration of all compensation laws, have been clearly brought out. We are yet at the threshold of compensation experience, and there is hardly a law among those enacted that does not display in some provisions this sad lack of practical experience with the actual working of compensation acts. In this paper I intend, therefore, to go a little beyond the analysis of the act of 1908 itself, and touch upon some fundamental features of administration.

The act is so brief that a bare statement of its provisions can be made very quickly. It establishes a system of compensation for injuries received in the course of employment, which cause disability for more than fifteen days or death, provided the injury is not due to the negligence or misconduct of the employe injured. It does not apply to all employes of the government, but only to artisans and laborers employed in certain rather hazily defined establishments of the federal government: namely, manufacturing estab-

lishments, arsenals, navy yards, construction of river and harbor and fortification work, and only hazardous employments in the Isthmian Canal Zone and in the reclamation service. The scale of compensation is full wages for temporary injuries up to one year's duration and, in case of fatal injuries, as much of one year's wages as was not paid between the time of injury and of death. The whole act fills less than two pages and most of the text is given over to administrative provisions which, however, are very limited, practically leaving the administration to the Secretary of Commerce and Labor.

To understand better these provisions of the act it is perhaps necessary to make some excursion into its history. Even though, as I have said, this was the first compensation act in this country, it was not without precedent. For some specially hazardous occupations in which workmen are employed by the United States similar provision for accidents had been made many years before. Thus in 1882 a system of compensation, not only for accidental injuries but also for diseases contracted in the line of duty, had been established in the United States Life Saving Service. It contained a peculiar scale of compensation, consisting of full wages for time lost with a maximum of one year's pay, though for fatal cases two years' wages were provided. Nearly twenty years later, through an obscure item in the Post Office Department appropriation act for 1901, approved on June 2, 1900, a system of accident compensation was introduced for an important branch of government service,—namely, that of railway mail clerks, first only for non-fatal accidents but later, through the appropriation act of 1903, also for fatal accidents. For the latter a lump sum payment of \$1,000 was provided, and this has recently been increased to \$2,000. These two systems, crude as they were, were undoubtedly better than the total absence of any provision in case of accident for the other government employees. But it is to be regretted that they exercised a stronger influence upon the act of 1908, as finally passed, than did all the experience of European legislation. At the time the agitation for the act was going on it was considered important that the federal government teach a lesson to the various state legislatures in the right method of legislation concerning industrial accidents. In various presidential messages, in the reports of the Secretary of Commerce and Labor, and in other publications, the federal government had committed itself

to a condemnation of the liability system. The active participation of important officials of the department in various compensation conferences showed its readiness to give support to compensation legislation. It was undoubtedly argued by many that if the powers of the federal government were so limited under the constitution as not to permit direct regulation of relations throughout the country, it at least could show itself to be a model employer and demonstrate the advantages of a new system. Here was a field of legislation where there were no constitutional difficulties to obstruct the way, and nothing could prevent the national government from passing a model law.

Let us, then, subject the main provisions of the act to some critical analysis. The greatest theoretical fault is found in the first section, which states that it does not cover accidents due to the negligence or misconduct of the employee. It thus limits the compensation principle materially, more so than does any of the European acts. Accidents intentionally self-inflicted are excluded in most European countries, those due to wilful misconduct in some, and to gross negligence or carelessness in others, but no act which pretends to be a compensation act has excluded all accidents due to the employee's negligence, even unqualified by the word "gross". It is somewhat doubtful whether, with strict adherence to scientific accuracy, an act excluding all such accidents can properly come under the designation of a compensation act. But it is true, and also interesting, that in actual practice the harm done by this limitation has not been great. An act concerning government employees has this advantage over other acts, covering private industry, that there is nowhere any very strong interest to interfere with its just administration. Occasionally the officers in charge of government industrial establishments have been inclined to oppose compensation which is paid out of their appropriations, but such opposition is naturally very much milder than when stimulated by fear of personal loss. Besides, the actual grant of compensation, as we shall see, has been concentrated in one department at Washington. It has been both surprising and gratifying to see how seldom men learned in law are ready to charge negligence, or to consider negligence as proved, when the element of personal profit and loss is entirely eliminated.

In that qualification, however, there was a definite compromise with the old legal concepts, which in 1908 may have been necessary

to assure the success of the bill. But it is much harder to defend or explain the limitations of the act concerning the extent of its application, especially in view of the absence of any other redress. Thus it is limited to artisans and laborers, and there are many employees of the United States government, even in hazardous employments, who could not properly be described as either artisans or laborers. Secondly, in regard to two of the several classes which we have enumerated above, another qualification is introduced in the term "hazardous employment", thus raising that long disputed question as to how many accidents must occur to make an employment hazardous, and how much satisfaction it is to an injured man to know that his employment is not hazardous. Nor is there any reason at all why that limitation should have applied only to work in the Isthmian Canal Zone and reclamation work, both of which are evidently undertakings with a high accident rate. To be sure, an act adopted at the last session of Congress has changed the situation in regard to the Isthmian Canal Zone.

Even outside of these limitations, however, the act does not apply to all government establishments. I gave you the list of included establishments a few minutes ago in the indefinite language of the act. But I could not definitely enumerate such establishments, for that would require a judicial interpretation of the act, such as devolves upon the Secretary of Commerce and Labor, upon advice of his solicitor. It is significant, for instance, that when the Judiciary Committee of the House submitted a report concerning this bill, and enumerated the establishments covered, it omitted to mention the Bureau of Printing and Engraving and the Government Printing Office, the two greatest printing establishments in the country, probably not considering printing a manufacturing industry; and that they were subsequently included by judicial construction. But, in addition, there are large numbers of artisans and laborers in the government employ who are not attached to manufacturing establishments, arsenals or navy yards; and statistics of accidents have clearly shown that there is an accident rate for each occupation, and that there is rather a heavy rate of accidents for such occupations as carting, draying, loading and unloading, cleaning of buildings, and storage,—all of which may be done and are being done for the government outside of manufacturing establishments, arsenals and navy yards. In fact, under the law, even under its broad-

est construction, only a minority of government employes are as yet protected, so that for the majority the old situation of no redress still obtains. According to an estimate made by the Judiciary Committee of the House of Representatives (H. R. 60th Congress, first session, report 1669), the act was to cover about 55,000 persons, in addition to some 16,000 persons covered in the Life Saving Service and the Railway Mail Service. Further computation would seem to indicate that the estimate was somewhat too low. It is probable that about 80,000 persons come under the act and some 20,000 persons under the older legislation, making a total of 100,000 out of 400,000 employed.

The severest indictment of the act, however, must be directed not so much against the limited extent of its application, as against the scale of compensation established. Many years of study of the history of compensation systems in various European countries has convinced me that faults of limitation are very much less serious than an unsatisfactory scale. In fact, the history of compensation in Europe gives many examples of a gradual extension of the compensation principle from a few industries to many, until the entire industrial field is covered; but the scale of compensation once established is likely to be very much more rigid, and instances of a thorough reorganization of the scale in Europe are very few. Nor is it at all difficult to understand the reason for this difference. Various forces combine in a movement for a change from the liability to the compensation principle. It is not only the workmen but their employers as well who sooner or later begin to feel the drawbacks of the liability system. Moreover, in so far as the employing interests may offer any resistance to compensation legislation on the ground of its costliness, it may be easier to overcome one industrial group after another; and a good deal may be said from the point of view of expediency for a gradual introduction of the compensation system. But, just as evidently, no other class but the workers themselves could have any interest in the increase of a compensation scale, and the entire employing class will obstinately resist any such increase. As to disinterested public opinion, it is almost impossible to get its support as strongly in favor of a change in the law as it was in favor of its introduction.

It is not an exaggeration to say that, in its treatment of serious injuries or fatal accidents, the compensation scale of the act of

1908 is the very worst that has ever been established in connection with a compensation law. Even the Spanish act, the least satisfactory of all European legislation, is twice as liberal as the act passed by the richest of the republics for its own servants. On the other hand, the extreme liberality in regard to minor injuries demonstrates entire lack of appreciation of the economic problems which such an act is intended to solve. In establishing this scale the precedence of the two compensation systems of very narrow application, concerning small groups of government employes, which I have mentioned above, has been made use of rather than the vast experience of Europe and the British Empire. But even in comparison with those two acts concerning the Life Saving Service and the railway mail clerks, the act of 1908 has cut the amount of compensation for serious and fatal cases just in half. In a case of fatal injury the maximum amount allowed is one year's salary, and even that is reduced by all the payments which have been made during the time intervening between the accident and death; so that in a case of lingering illness resulting from the injury the compensation for a fatal accident would be ridiculously small or nothing at all. Such a valuation was never put upon human life even by the strictest of our courts or the most heartless of our insurance companies. The same maximum of one year's compensation is granted in case of permanent injuries, whether resulting in total or partial disability. In fact, amazing as it may seem, this act, passed twenty-five years after the compensation system originated in Europe, and when twenty-two countries had more or less satisfactory compensation laws, fails even to mention permanent injuries, nor does it show in any way that it distinguishes between total and partial disability. The problems which must of necessity arise in an effort to administer justice under this act will be appreciated by any one familiar with the nature of industrial accidents.

On the other hand, for minor accidents, for all accidents leading to temporary disability only, it provides a scale of compensation which in its liberality has no equal. Full wages for the time lost are given, when the European practice is to grant an amount anywhere from 50 to 66 or, in one case, 70 per cent. Theoretically there is perhaps nothing to be said against the justice of an injured workman receiving the full amount of the economic loss sustained. But the administrative problems created by the encouragement of

malingery through this provision become serious at once, for the system creates no incentive at all to return to work, especially in view of the absence from the act of proper safeguards against malingery and fraud. Besides, the illogical juxtaposition of these two systems of compensation,—full wages for temporary incapacity, even if the injured person be partially disabled, and no compensation after the expiration of one year, even in case of total blindness (an actual case),—makes the act well-nigh ridiculous in the eyes of the critical workman. And finally, Congress, as if actuated by the malicious purpose of putting a premium upon malingery and thus entirely discrediting the act, established a waiting time of two weeks; no compensation is given if an injury has lasted less than fifteen days, but as soon as the disability extends into the sixteenth day full wages for the entire time lost are granted. Even in Europe, where the waiting time is usually shorter, and where the compensation paid is only half or two-thirds of the wages, this waiting time has been found to be a source of abuse. But an injured workman would have to be a paragon of virtue, and possess a degree of honesty which in this practical world of ours would be classified as pure folly, to recover and return to work on the thirteenth or fourteenth day. When the statistics of accidents of government employes are finally published, it will be interesting to ascertain how this one provision has influenced the number of disabilities lasting just over two weeks, compared with the number lasting under two weeks; and further how the figures compare with European data available on the subject of duration of disabilities. It is quite unfortunate that the very first American compensation act proved to be a school of malingery. Only the essential honesty of our workingmen has limited the damage that could be thus done to the progress of the compensation idea.

These are the main objections to be raised against the provisions of the compensation act. If it was intended to be an object lesson in social justice to the many state jurisdictions in this country, it has signally failed. No matter how many shortcomings may be found in the various compensation or insurance acts passed in the last two years, they are all vastly superior to the act of 1908 in that they have not committed the gross errors which I have indicated. The federal legislative power has undoubtedly missed the opportunity to use its prestige and influence for the furthering of this important branch of labor legislation. The history of com-

pensation since the act was passed corroborates what I have said concerning the difficulty of amending a poor piece of legislation. The amendments concern mainly employes of the Isthmian Canal Commission; the application of the act has been extended to all artisans and laborers in the Isthmian Zone, thus doing away with the qualification of hazard; the waiting time provision for these employes has been practically destroyed; and, by transferring the administration of the act from the Department of Commerce and Labor to the Canal Commission itself, the procedure has been considerably simplified and accelerated. We have become so used to the idea that the employes of the Canal Zone are the special wards of the government that we did not even question the justice of such discrimination, but the future historian of labor legislation in this country may have some difficulty in understanding why the same measure of justice should be refused to the permanent and regular employes of the state.

A few efforts to amend the substance of the law have been made during the last three years, but as yet they have not gone beyond the introduction of bills. What the immediate future will bring us I do not assume to be able to say; but the situation at present remains practically what it was three or four years ago,—that is, the federal government employe is still in a very much less satisfactory condition when injured by industrial accidents than the wage-worker in the employ of a private corporation.

The army of industrial employes of the federal government, to be sure, is but a small part of our industrial population, and so the whole question may be considered by some to be purely local and of minor importance. One finds, for instance, that in the industrial world at large very few people know anything at all about the act of 1908, and even in the discussions before the United States Commission on Employers' Liability and Workmen's Compensation the interests of the direct employes of the government are singularly disregarded. With this view I most emphatically disagree. To begin with, even 100,000 people represent a perceptible factor in our industrial life. That is a larger industrial population than many of our states can boast of. Then again, I have shown that these figures represent hardly one-fourth of the total number of employes of the government. But the indirect effects of this legislation are perhaps even more important than the direct ones. In a democratic coun-

try the least that the state can do in regard to the labor problem is to be a model employer, not necessarily by offering a scale of wages entirely out of proportion to the market price (and thus perhaps making a government position a matter of graft), but by creating the best conditions of employment possible; and among such conditions compensation for industrial accidents evidently occupies a very prominent place. Whoever has lived in Washington may remember the loud arguments in favor of an ideal child labor law, which in a city altogether devoid of industrial life would perhaps not have been such a very difficult matter; and, though the efforts for this ideal child labor law have failed, still the failure is not such a pronounced one as in the case of the compensation act. Whether the immediate future will bring us a rapid increase in the industrial activity of the federal government it is hard to tell, but when one considers all the industrial enterprises carried on in this country by various governmental agencies, whether national, state or local, one will readily see the importance of providing equitable compensation acts for the workers so employed. No constitutional difficulties stand in the way of even the best legislation so far as the employes of the government are concerned. That seems to be the consensus of opinion of our best legal authorities. We cannot, therefore, blame the dead for failure to pass the necessary laws. The responsibility rests upon the living.

There is another matter of considerable importance to which I should like to call your attention briefly. In what I have said until now I was referring only to the substantial provisions of the act. There is another aspect of compensation laws, the matter of proper administration. Any one who has studied the history of the entire compensation movement in Europe and has had some experience in the settlement of claims for industrial accidents, will agree that problems of administration are extremely important in themselves. Now that the theory of the movement has been fairly well settled in Europe, the discussion concerns mainly the problems of proper and equitable administration. An analysis of the American acts which have passed during the last two years will show that, while we have finally absorbed the main principles, while we have learned a good deal since 1908, while we know the necessity of differentiating between temporary and permanent disability, between partial and total disability, still we are yet considerably in the air so far as

the proper administration of such acts is concerned. We are afraid to create proper governmental machinery, perhaps for lack of persons sufficiently familiar with the subject to fill the positions; and yet it is quite certain that if serious administrative difficulties have arisen even in England, Germany, France, and Italy, where the administrative difficulties were much better understood from the beginning, the situation is bound to be very much worse in this country unless proper measures are taken in time. The serious social damage done by such lack of proper administration is not that a few malingerers or liars will get compensation to which they are not entitled, but that the constant demonstration of cases of injustice or fraud, by the irritation it produces in public opinion, will prove a serious handicap in amending the law and in extending its benefits, and will be injurious to the entire field of social legislation. The proper determination of the injury and of the degree of permanent disability, the question of subsequent changes in the physical condition, the proper connection between the injury and the accident, the effects of preceding diseased conditions, and the question of fine shadings between accidents and industrial diseases, these and many other subjects are of extreme importance in the administration of any compensation law. Though one of the objects of all compensation legislation is the elimination of disputes, yet some disputes must necessarily arise, and no act is complete which does not provide an effective and rapid method for their disposal. It will be many years before all these problems of good administration are satisfactorily solved in all the fifty states of this country.

Here again the federal government, with its unlimited resources for study, investigation and experimentation, could prove of very good service. Unfortunately the administrative provisions of the act as it exists at present are not very much better than its substantial provisions. On the one hand, with the exception of the Isthmian Canal Zone, the direct administration is put into the hands of the highest authority, the Secretary of Commerce and Labor, from whose decision there is no appeal; so that injustice is necessarily very much more difficult to correct than would be the case if the department acted only in cases on appeal. On the other hand, there is a childish display of faith in the integrity of the entire medical profession in this country, which recent study of the status

of medical education would hardly justify. The affidavit of the attending physician, which is repeatedly mentioned in the act, is evidently considered in the light of some sacred shibboleth, which alone guarantees the truth and justice of this world. I cannot resist the temptation to quote a remark of a very shrewd insurance president who is not yet convinced of the justice and expediency of compensation legislation. "They talk of the advantages of eliminating waste," he said to me, "while under the liability system it was the lawyer who got the best share of the cost of insurance, and under compensation laws it will be the doctor who will get it; but that does not make such an awful difference so far as I am concerned." Exaggerated as this statement may be, there is some grain of truth in it, as anyone connected with the administration of the compensation acts in those states where such acts have been passed will very soon learn. The problem is new in this country, but some notice of it was given in the exaggerated and biased statements of Dr. Friedensburg which attracted such attention in our press some months ago.

In the administration of the federal compensation act the problem appeared very early. For a few months, while bureaucratic methods prevailed and cases were decided exclusively on paper evidence, things looked quite smooth within. But with the first investigation of the doubtful cases in the field, which it was my fortune to make, all the difficulties and the possibilities of injustice in connection with the act appeared quite clearly. One difficulty was the failure of the law to differentiate between total and partial disability, and the consequent impossibility in many cases of determining the existence of disability; another was the lack of proper safeguards against fraudulent medical certificates; a third was the clash of honest opinion between the private physician and the government surgeon existing in many establishments as to the existence of disability; and a fourth was the decided lack of sympathy among many high officers with the purpose of the act, which expressed itself in many futile appeals to such threadbare arguments as the assumption of risk by the employe and the explanation of the accident by his own negligence. Some of these difficulties were easily disposed of. It was a constant source of satisfaction to see how some judicious propaganda and explanation succeeded in destroying the old philosophy of negligence and establishing the new concept

of trade risk. Curiously enough, the military and naval surgeons were often very much harder to convince than the actual managers of large establishments.

Other difficulties require more energetic measures. As was perhaps natural, since the administration of the act was delegated to a bureau which up to that time had done no administrative work whatsoever, and since the problem presented was a new one, the regulations issued were somewhat childish in their simplicity and their faith in the goodness of human nature, both of the plant managers and of the injured workmen. They simply put into force the few administrative requirements contained in the law, and, though the act authorized the Secretary of Commerce and Labor to amplify those requirements, it was questioned by his legal advisers whether any new duties could legally be imposed upon the workmen or the administration. But as experience has grown in the investigation of claims it has become quite evident that the following principles are absolutely essential in the good administration of any compensation act: a proper method of medical supervision over the injured employe, the right of the employer or of the state to demand medical examination, a proper and equitable system of medical arbitration by recognized experts to adjudicate cases of disagreement, and the right to insist that the injured receive proper medical treatment. In this country, with the wide popularity of absent treatment, faith cure, Christian Science, naturopathy, osteopathy and many other pathies, even this is sure to be a serious problem. Another feature of administration which early became quite important was the great advantage of a satisfactory organization of factory medical aid, both in preventing complications and in facilitating medical control. In short, in the proper administration of a compensation law, distinct from a liability law, the three essential things appeared to be proper medical aid, proper medical control, and medical arbitration which should be fair to both parties; for if the dishonest private physician was occasionally found to be willing to help a malingerer, the government medical officer was sometimes found to be unsympathetic, suspicious, and antagonistic to the interests of the injured. During all my connection with the administration of the act I have continued to urge, with almost Catonian obstinacy, the necessity for the revision of the regulations upon the basis of these three principles.

In some of the departments, with many industrial undertakings, the same difficulties were felt by the establishment officials. As a result of the persistent agitation a conference of representatives of all executive departments was called together by the Secretary of Commerce and Labor to consider the problems of administration of the act; and also to consider what amendments to the act itself are necessary to make it a more workable and equitable measure. The conference was held in March, 1910, and presented a report to the Secretary of Commerce and Labor, together with a complete draft of new regulations for the administration of the law and various propositions for amending the act itself. They are briefly referred to in the report of the Department of Commerce and Labor for 1910. As the report and recommendations have not yet been published, they remain, unfortunately, beyond the scope of public consideration. I do not think, however, that I am disclosing any official information if I say that, according to the latest information received, the recommendations concerning the administration of the law have been approved and are soon to be promulgated. It is hoped by those who helped prepare them that when published they will prove not only of use in the administration of the federal act, but also a contribution to the solution of the same administrative problems in the various states.

In any case, the report of the conference when published will demonstrate to our lawmakers the great importance of proper elaboration of administrative details as well as of the essential principles of compensation law. It will bring home the necessity for making a thorough study of the practice of European nations, so as to profit by their experience. As yet it must be said that, even in the best American acts, very little of such study is evident. We are not altogether cured of our contempt for European precedents, and as a result we often repeat blunders which European practice has effectively disposed of many years ago.

CONSTITUTIONAL STATUS OF WORKMEN'S COMPENSATION

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If at the beginning of the year 1911 the constitutional status of workmen's compensation was one of uncertainty, at the end of the year it could hardly be characterized otherwise than as one of confusion. On March 24, 1911, the Court of Appeals of New York declared the carefully framed and conservative compensation act of that state unconstitutional, and by an unanimous decision condemned the very principle of the legislation, not as intrinsically objectionable, but as contrary to the positive limitations embodied in the guaranty of due process. (*Ives v. South Buffalo Ry. Co.*, 201 N. Y. 271; 94 N. E. 435.)

The Supreme Court of the State of Washington, on the other hand, on September 27, 1911, in sustaining a compulsory insurance law, strongly endorsed a theory of the police power which would also support compulsory compensation, and the decision must therefore be regarded as opposed to that of New York. (*State ex rel Smith-Davis Co. v. Clausen*, 117 Pac. 1101.) The principle of compulsory insurance was likewise sustained by a decision of the Supreme Court of Montana, although the act of that state was declared invalid as arbitrarily discriminating between employer and employe, giving the latter an election between his common law right of action and the compensation under the act, while the employer was required to pay the insurance assessment at all events. (*Cunningham v. Northwestern Improvement Co.* 119 Pac. 554, Nov. 21, 1911.) So-called elective laws (of which more later on) were upheld by an opinion of the justices of the Supreme Court of Massachusetts, and by a decision of the Supreme Court of Wisconsin. (Opinion of Justices, 96 N.E. 3081, July 24, 1911; *Borgnis v. The Falk Company*, 133 N.W. 209, Nov. 14, 1911.) These two courts carefully abstained from committing themselves with regard to the problem of compulsory compensation, but the language used by the Wisconsin

court is unmistakably friendly to it. Under the influence of the New York decision, the compensation laws of California, Illinois, Kansas, New Hampshire, New Jersey and Ohio (the latter an insurance law) were likewise made elective.¹

The Federal Commission on Employers' Liability and Workmen's Compensation, however, has prepared a bill framed upon the principle of compulsory compensation which the New York Court of Appeals rejected. The action of the federal commission in repudiating the conclusion reached in New York is significant; and it is merely another evidence of the fact which must have impressed itself upon all observers,—namely, that the New York decision is not generally accepted as finally settling the question. The expressions of dissent and criticism have been numerous and strong, and since the New York decision is not binding in other states or on the federal courts, it is well to restate the reasons upon which is based the hope that the decision will in course of time yield to views which are sounder legally as well as socially more satisfactory.

In criticizing the decision of the Court of Appeals of New York, it must be borne in mind that the New York law was limited to the trade risks of hazardous industries. Somewhat different considerations are presented by compensation laws not so limited, by compensation laws operating through insurance, and by optional or elective compensation laws.

I. THE DECISION OF THE NEW YORK COURT OF APPEALS.

The main arguments against the soundness of the law laid down in the Ives case are, that the analogies of principles previously sustained logically demand a different conclusion, and that the view taken of the guaranty of due process is unduly narrow.

1. *Analogy of other statutes.*—The validity of the liability created by the law of New York is supported by the analogy of other statutes which have been sustained. The analogies most strongly relied upon before the Court of Appeals of New York as supporting the validity of the law were: first, the liability of railroad companies for damage done by fire caused by sparks escaping from locomotives; second, the liability of railroad companies for in-

¹ Since the above was written, the Ohio law has likewise been sustained in the case of State *ex rel* Yaple, Jan. 16, 1912.

juries to passengers under the law of Nebraska; and third, the liability to injured seamen under the maritime law. The liability of railroad companies for fire had been sustained by the Supreme Court of the United States as a liability imposed irrespective of fault. (*St. L. & S. F. R. Co. v. Mathews*, 165 U. S. 1.) The New York Court of Appeals gives a number of reasons why this analogy should not be accepted as controlling. It urges that the constitution of Missouri (the case having arisen under a statute of that state) contains a clause to the effect that the exercise of the police power shall never be abridged or so construed as to permit corporations to conduct their business in such a manner as to infringe the equal rights of individuals or the general well-being of the state. Will any one seriously deny that the same principle, whether expressed or not, must exist in every state, or contend that it can be relied upon to modify the guaranty of due process? Must not the principle of due process always and everywhere be interpreted in subordination to the principle thus expressed in the constitution of Missouri? The court of appeals further quotes from a federal court to the effect that "the right to use the agencies of fire and steam in the movement of trains is derived from the legislation of the state and it certainly cannot be denied that it is for the state to determine what safeguards must be used to prevent the escape of fire and to define the extent of the liability for fires resulting from the operation of trains by means of steam locomotives." Why, it must be asked, is this proposition not applicable quite as well to the protection of employees as it is to the protection of adjoining land owners? The court of appeals leaves us without answer. And finally the court of appeals says: "These statutes are designed to protect the rights of those who have no contractual relations to the corporations which inflict the injury. In such a case, when both parties are equally faultless, the legislature may properly consider it to be just that the duty of insuring private property against loss or injury caused by the use of dangerous instruments, should rest upon the railroad company which employs the instruments and creates the peril for its own profit, rather than upon the owners of the property who have no control over or interest in these instruments." Why cannot the legislature give force to the same considerations in favor of the employee? Surely the whole trend of modern so-

cial thought is opposed to the distinction made by the New York court.

The court of appeals also rejects the analogy of the Nebraska law, sustained by the federal Supreme Court, which made railroad companies absolutely liable for injuries to passengers, excepting injuries due to the violation of some express rule of the company actually brought to the notice of the passenger. This principle of liability is almost identical with the one of the New York act. The New York court says that the point decided in that case was that this rule of liability was a part of the very statute under which the corporation took its charter. It is true that the Supreme Court, in the closing paragraph of the opinion, states that this is sufficient to sustain the statute, but it is also true that the much greater portion of the opinion is devoted to a justification of the rule upon principle, and unless the Supreme Court repudiates the arguments used in this case it would seem to stand committed to the principle of absolute liability, at least for railroad companies. (*C., R. I. & P. Ry. Co. v. Zerneck*, 183 U. S. 582.)

2. *Analogy of the maritime law.* The liability of the New York act was further analogous to the liability of the ship for the expense of caring for and curing a mariner who is injured in the service of the ship, a principle recognized by the maritime law of all nations, including England and the United States. The court of appeals speaks of peculiar rights and privileges wisely and benevolently built up by the maritime law for the protection of seamen, which are not cognizable in the common law. As a matter of fact these rights are cognizable in the common law, for a common law court, as well as a court of admiralty, will enforce these principles. (See *Scarff v. Metcalf*, 107 N. Y. 211, and *Holt v. Cummings*, 102 Pa. 212.) Furthermore, this liability is neither confined to exceptional circumstances of an injury happening during a sea voyage, nor to an injury due to the perils of the sea, for it has been enforced in favor of an engineer working on the ship while in port exactly as any other engineer might be working at the same kind of occupation on shore. (*Holt v. Cummings*, 102 Pa. St., 212.) It is true that the liability of the ship extended only to the expense of the care of the disabled seaman, who was not entitled to indemnity for permanent loss of earning capacity. But

is it possible that the principle of due process is consistent with indemnification up to a certain point, while it forbids an indemnity calculated upon a more liberal basis? The essential point is that the expense arising out of an injury for which the ship owner is in no wise to blame and which may even be due to the fault and negligence of the injured seaman is charged against the ship, thus clearly recognizing a liability without fault. Whether that liability is restricted to the expense of curing or is extended to the care of the permanently disabled person after his actual sickness is over, cannot be the difference between due process and lack of due process. The court of appeals says that the maritime law is exceptional in its character. It should, however, be borne in mind that in the older law the occupation of the mariner was the one occupation conspicuous for hazards at a time when great mechanical forces were not ordinarily employed in industries.

3. *Analogy of the liability of the master for the act of his servant.*

—The liability of the employer irrespective of his fault is finally analogous to the general principle of the liability of the master for the acts of his servant. It is not always recognized that the principle *respondeat superior* is a principle of liability without fault. The civil law makes the master liable only for lack of proper care in selection or supervision; the common law, in making him absolutely liable toward others than servants for the fault of a servant, departs from the strict and normal rule of justice based on moral fault and responsibility. The abrogation of the fellow-servant doctrine further extends this principle of expediency. Where the employer has used all possible care in selecting and supervising his servant, the negligence of the servant resulting in injury to another servant is, so far as that employer is concerned, as much an accident as any other accident resulting from imperfections in his machinery or plant which the employer can by no possible care avoid. There is, therefore, no controlling difference in constitutional principle between the abrogation of the fellow-servant doctrine and the liability of the employer for an accident which is due to a risk inherent to the trade. As Senator Sutherland, the chairman of the federal employers' liability commission, tersely puts it, in the one case the master is held responsible for the fault of the dangerous agent and in the other for the fault of the dangerous agency. (Briefs, p. 159.) Conceding, as the court of appeals

does, that the legislature may abrogate the defenses both of common employment and of ordinary contributory negligence, it is inconsistent to hold that the legislature cannot create the liability which was proposed to be created by the New York act.

4. *The liability for trade risks and due process of law.*—If we assume, for the sake of argument, that our law has had in the past no analogies to workmen's compensation, and that the new legislation embodies an entirely novel principle, that principle should not for that reason alone be repudiated as contrary to due process.

Three rules may well be laid down for the application of the guaranty of due process, by which the New York decision may be tested: *first*, In establishing new canons of justice, the legislature is neither bound by every historical limitation of the common law, nor is it free to advance so far beyond prevailing ideas as to make the law utopian or even socialistic or communistic; in other words, the law may be in its reasonableness progressive, and it must be in its progressiveness reasonable; *second*, The standard of reasonableness must be approved by the courts, and *third*, The standard of reasonableness should be the same for the state and for the nation.

Applying these rules to the relation between employer and employe, it must be insisted that the law may go beyond the elementary grounds of liability,—*viz.*, consent and fault,—and advance to a new basis, which may be properly designated as that of social solidarity. Of course, if the first portion of the argument here presented is sound, the basis is not new at all; but assuming it to be new, its recognition imposes itself upon our law by the force of prevailing industrial conditions. Social solidarity, however, is not to be conjured up at the will of the legislature, but must be founded in the nature of relations and in our social consciousness. To illustrate: The court of appeals asks whether my neighbor can be made to pay my debts; certainly not, for the basis of social solidarity is lacking. Nor would there be such solidarity between landlord and tenant under modern conditions. Were the law to make the employer liable for the loss falling on an employe through disease contracted outside of the employment, it would probably have to be judged, not as a rule of liability, but as a radical legislative change in the relation of employment and of its economic terms. But where the employer is made liable to a partial compensation for losses due to the risks of a hazardous industry, which are

either actually or humanly speaking inevitable, the solidarity is obvious and undeniable, and had it been recognized by the unwritten law its abrogation might well be condemned as arbitrary and unreasonable.

The imposition of such a liability does not alter the economic terms of the contract of employment. Such a view may to a certain extent be justified if the employer is required to indemnify in part his employe for the losses due to ordinary sickness, or old age, or unemployment. But in the case of compensation laws, the loss for which indemnity is paid is the result of an undertaking carried on by the master for his own benefit. These laws simply fix the consequences of conditions inherent in the transaction and practically beyond the control of either party. Viewed in this light, they bear no analogy to those laws which have been condemned as interfering with the essentials of economic liberty whereby parties are free to agree upon the terms of buying and selling labor, assuming for the sake of argument that that liberty cannot be impaired. (*Lochner v. New York*, 198 U. S. 45; *Adair v. U. S.*, 208 U. S. 261.)

The substitution of a compensation on a fixed basis, for damages estimated from case to case, is justifiable because it means a practical approximation toward justice in preference to a theoretically perfect justice adapted to each individual case, which in practical administration has proved to be arbitrary, speculative, and grossly unequal guesswork. It seems to have the sanction of the Supreme Court of the United States, in the decision supporting the front-foot rule of special benefit assessments. (*Parsons v. District of Columbia*, 170 U. S. 45.)

When it is laid down as a second requirement of due process that the standard of reasonableness must be approved by the courts, recognition is not merely given to the established operation of our constitutional law, but also to the principle that the standard of reasonableness must commend itself to the conservative sense of the community which the judiciary represents more faithfully than the legislature. While the test of judicial approval is not infallible, it is the most practicable which we have, and under our institutions a condition in which the judiciary is seriously out of harmony with the deliberate and sustained will of the community can only be temporary, and had much better be overcome by seeking to

bring about a change in judicial opinion than by overturning it by popular verdict. Negatively expressed this same requirement means that the definition and evolution of due process should be a matter of judicial interpretation, and not of popular decision by referendum from case to case. And this also follows from the third proposition that the standard of reasonableness must be the same for state and nation; for a state referendum cannot affect the fourteenth amendment, and a national referendum is impracticable.

It is at this point that issue must be taken most emphatically with the Court of Appeals of New York. In referring to the demand for a change in the law, it says: "We have already admitted the strength of this appeal to a recognized and widely prevalent sentiment; but we think it is an appeal which must be made to the people and not to the courts." Apparently the court places upon the due process clause of the state constitution a construction by which it is made to embody the limitations of a historical state policy not identical with, but narrower than, the limitations imposed by the national constitution, with the result that state due process becomes a purely conventional principle which time may show to be inadequate to satisfy the demands of a more perfect justice and which is therefore susceptible of improvement to be brought about by constitutional amendment. The method of specific constitutional amendment to sanction workmen's compensation encounters the difficulty of finding a proper formula of grant of power; either it is sufficiently wide to cover future needs and developments, in which case the submission to popular vote must reckon with the natural apprehension of the voter that his favorable vote may be construed as giving sanction to projects which he does not for the present approve; or the formula is adapted to the particular exigency, in which case doubt is thrown at once upon all legislation not coming within its terms. The dilemma is inevitable and demonstrates that this method of dealing with the difficulty will fundamentally alter the theory of our state constitutions, transforming them from charters of limitations into miscellaneous collections of enabling acts.

Whatever, therefore, may be thought expedient in view of the particular exigencies of the New York situation, as a general principle the method of adopting a narrow construction of due process and then allowing it to be overridden by constitutional amendment cannot be commended as either desirable or right in principle.

If it were possible to use the power over corporations to enact a compensation law applicable to businesses conducted under corporate organization, this might furnish a solution of the problem with which the people of New York are confronted; for not only are nearly all, if not all, the industries affected by the New York law under corporate control, but the discrimination between corporate and individual employers as regards liability toward employees ought, in the absence of an adverse decision by the Supreme Court of the United States, to have a good chance of being sustained by the courts. But the suggestion made by Chief Justice Cullen in his concurring opinion, that a compensation law might be confined to corporations to be created hereafter, or that revocable charters of existing corporations might be revoked and reorganization be permitted only upon condition of accepting the law, is impracticable.

II. ELECTIVE OR OPTIONAL LAWS

Outside of the state of New York the constitutional difficulty was sought to be met in another way. Since the New York decision was the first one to come from a court of last resort upon this phase of constitutional law and was rendered by an unanimous court and one of the highest standing in the country, it was felt in other states where compensation bills were pending at the time that it would be unwise to press measures based upon the principle thus rejected, and all these states, except Washington, made their laws at least nominally optional or elective.

The experience of Massachusetts, where a law of 1907 allowing the substitution by agreement of a compensation scheme for common law rights and liabilities had remained a dead letter, made it likely that a purely optional measure would be of little practical effect. The new laws seek to avoid failure in this respect by encouraging election in various ways. So they all establish presumptions in favor of election, to be overcome only by express notices of dissent or non-acceptance, generally for both employers and employees, but in California and under the insurance systems only for employees. If the law goes no further than creating presumptions there can, perhaps, be no objection, constitutional or otherwise. A simple presumption, however, was considered inadequate. A further pressure was sought to be exercised upon the employer by taking from him the well known common law defenses of assumption of

risk and fault of fellow-servant (in Wisconsin only where there are at least four employes), and either abrogating or in various ways qualifying the absolute bar of contributory negligence. The power of the legislature to abrogate these defenses is generally conceded, and where, as in California and New Jersey, the abrogation is unqualified, the motives of the legislature are beyond judicial control. However, in order to exercise a similar pressure upon the employe, the abrogation is generally qualified by providing that whereas, if the employer shall elect not to accept the provisions of the law he shall lose the defenses, he retains them if, after he has accepted, the employe, refusing to concur, sues at common law. This double-edged coercion is found in Illinois, Kansas, Massachusetts, New Hampshire, Ohio, and Wisconsin.

It is most undisguised in the act of Kansas, in which sec. 46 provides for actions to recover damages brought by an employe entitled to come within the provisions of the act against an employer who might come, but has elected not to come within its provisions, that the three defenses (assumption of risk, fault of fellow-servant, contributory negligence as absolute bar) shall not be available to the defendant employer; while under sec. 47, in an action to recover damages brought by an employe who would be entitled to come within the provisions of the act, against an employer who has elected to come within its provisions, the employer (unless he or a managing agent was wilfully or grossly negligent) shall retain these defenses unimpaired.

Wisconsin accomplishes the same result by first abrogating two of the three defenses and then providing that any employer who has elected to pay compensation shall not be subject to the provisions of the abrogating section; for this likewise visits the failure to elect with the penalty of the more unfavorable position in the common law action, since the workman who insists upon suing for damages instead of electing compensation obviously remains subject to the defenses. The act in terms speaks only of the relief to the employer from a new burdensome provision and leaves it unexpressed that the benefit to the employe which results from the burden laid on the employer is taken from him, if he does not elect to take compensation. Massachusetts even goes to the length of depriving employes who sue at law of the benefits of the earlier employers' liability acts of that state (last codified in 1909),—acts

which were intended to remedy a condition of the law grossly unjust to the employe.

If this novel method of forcing acceptance of a so-called optional measure is analyzed, it will appear to amount to this: that the legislature proposes to have justice administered to two parties to the same relation upon different terms, offering to each conditions unfavorable to him and giving him the chance of redeeming himself by declaring his willingness to accept the new method of relief. Either the legislature has the power to compel compensation: can it then exercise this compulsion in the roundabout way of denying justice except upon terms not applied to all alike?—or it has no such power: can it then do by indirection what it cannot do directly? This serious question goes to the very root of the laws of Illinois, Kansas, Massachusetts, New Hampshire, Ohio and Wisconsin. In New Hampshire the difficulty is aggravated by the fact that the employer, before he can elect to come under the act, must establish his solvency by filing a bond conditioned upon the discharge of his liabilities.

With the single exception of New Jersey, all the states also treat employer and employe unequally in the matter of exercising the option. In Kansas and Ohio the employe can escape the operation of the act only by leaving the employment; the same is true in New Hampshire, where the law is silent as to his right of election; while in California, Illinois, Massachusetts, and Wisconsin the workman may refuse compensation once, but having once accepted remains bound, whereas the employer is at liberty to withdraw every year. The acts apparently assume that it is superfluous to safeguard the rights of the employe, since the employer can in any event force acceptance of his terms by dismissing the recalcitrant employe. Thus there seems to be a discrimination against the employe in the matter of election, which adds to the other difficulties of the elective scheme.

The acts ignore the sound principle demanded by the specific clauses of our constitutions guaranteeing to each person the right to have his remedy in court freely and without purchase, as well as by the general guaranty of the equal protection of law, that justice must be administered upon equal terms to all irrespective of collateral considerations, and not with a view to driving people into a legislative policy which it is feared may be unconstitutional.

The Supreme Court of Wisconsin attempts to dispose of this difficulty as follows:

"But it is said that there is no proper classification here, and hence that the law is fatally discriminating in its character. The two defenses are preserved intact to employers who elect to come under the law and taken away from those who do not so elect. The rules governing classification are familiar and are in brief as follows: It must be based on substantial distinctions which make real differences, it must be germane to the purposes of the law, it must not be limited to existing conditions only and must apply equally to each number of the class. It seems to us that this classification fully meets these requirements; certainly there will be very real differences between the situation of the employer who elects to come under the law and the employer who does not. If the consenting employer only employs workmen who also elect to come under the law he can never be mulcted in heavy damages and will know whenever an employe is injured practically just what must be paid for the injury; surely this is a different situation from the situation of the man who is liable to be brought into court by an injured employe at any time and obliged to defend common law actions upon heavy claims unliquidated in their character, the outcome of which actions none can foretell. On the other hand, if, as seems quite likely, the greater part of the consenting employer's workmen consent but some do not and these latter are still retained in the employment, the same considerations will apply with somewhat less force. On the one hand there is a class of consenting employers employing wholly or largely consenting workmen, and having definite and fixed obligations to their workmen in case of injury; on the other hand is a class of non-consenting employers who have no such fixed obligations in case of injury to their workmen, but choose to meet every such workman in court and fight out the question of liability. There seems a very robust difference between these two classes. But after all there is another distinction which seems perhaps more satisfactory; the consenting employer has done his share, and it must be considered a considerable share, in rendering successful the legislative attempt to meet and solve a difficult social and economic problem. Even if it be true (which, as before stated, is not decided) that he may not be compelled under our constitutions, state and national, to assist in the solution of this problem, still does not his voluntary act in giving that assistance constitute a substantial distinction, making a real difference of situation between him and the employer who refuses his aid, a difference which justifies a difference in treatment?"

This argument certainly does not carry conviction if the legislative attempt to meet and solve a difficult social and economic problem involves an unconstitutional burden; for shorn of all verbiage it amounts to saying that a person may be penalized for standing upon his constitutional rights. As was recently said by the Supreme Court of Ohio (*Byers v. Meridian Printing Co.*, 95 N.E. 917, 919.):

"We are not disposed to question, at least for our present purpose we will not, that a citizen may waive a constitutional right; but we do deny that he can be compelled to waive his right, or that he can be arbitrarily subjected to an option to stand upon one right under penalty of losing another."

If, on the other hand, the legislative policy is such that under the constitution it would be possible to carry it out directly, the objection remains that the method of indirect coercion involves an unprecedented bartering of the terms of administering justice. And this objection remains, even though the method should be declared, as in Wisconsin it has been declared, to be constitutional. It is conceded to be a piece of legislative trickery; it must confuse the common sense of right and wrong; and it makes a mischievous precedent which in time to come will give trouble to those who invented it. Why should not the legislature indirectly force arbitration regarding wages by juggling the rights and remedies relating to the various incidents of strikes, depriving as far as it can be done non-consenting employers of their right to injunction, and making picketing on the part of non-consenting employes a penal offense? The classification would be that sanctioned by the Supreme Court of Wisconsin.

It is a further undesirable consequence of this system of so-called election that, under the plea of voluntary acceptance, the burden imposed upon the employer may be carried far beyond what would be regarded as constitutionally safe in case of direct legislation. Thus it happened that the courts of Wisconsin and Massachusetts considered themselves absolved from the duty of passing upon the merits of accident liability not confined to the trade risks of a hazardous industry. On the theory of election there is no reason why the legislature should not leave the final adjudication of compensation claims to a political board.

It will also be interesting to watch how the problem of necessary amendments will be handled in the case of laws which rest in theory upon voluntary adoption.

III. THE QUESTION OF HAZARD

It remains to say something upon the constitutional aspects of workmen's compensation that have not been covered by the foregoing observations. And first as to liability for accidents arising out of

and in course of employment in any industry, though not specially hazardous, or not due to such hazard.

The arguments advanced in favor of the liability which the New York act proposed to create lose some of their convincing force if the restriction to hazardous industries and to risks inherent in the trade is abandoned. In giving the benefit of compensation to all employes and extending it to injuries that have nothing to do with the nature of the particular employment, the law practically makes every contract of employment a partnership in the ordinary risks of any occupation and not only those risks which are inevitable, but also those which are due to the carelessness of the employe. That is to say, the employer is made to share the risks of the employe, not *vice versa*. Where the employer operates on a large scale, it is the expediency rather than the justice of the principle of liability which impresses the mind; where the employer has only very few employes, and is not greatly superior to them in the social or economic scale, it is rather the injustice which is obvious. The exemption of domestic servants and farm employes seems to be based upon the recognition of the injustice of such a liability, but in reality emphasizes it by discriminating against other small employers and raises a question under the equal protection clause of the federal constitution.² The English compensation act is free from this discrimination.

The strongest argument in favor of the constitutionality of a liability not based upon special hazards is that it is after all no more objectionable than the rule of *respondere superior* applied in the same way, which has never yet been challenged, or than the abrogation *in toto* of the fellow-servant doctrine, or of the doctrines of assumption of risk or contributory negligence, without regard to the nature of the employment, which seems to be conceded to be valid.

If the law applies to hazardous industries only, but is not confined to accidents due to trade risks and extends to any accident arising out of or in the course of employment, the constitutional

² The Supreme Court of Massachusetts holds, in the opinion rendered by the justices on the compensation bill, that the discrimination is not fatal, so far as the abrogation of the common law defenses is concerned. The law of Wisconsin exempts all employers of less than four employes from the abrogation of the fellow-servant doctrine.

aspect is in one respect similar to that of a law applying to non-hazardous industries. Such is the law of Washington, and the bill proposed by the federal compensation commission. The Supreme Court of Washington has left the question of validity, in view of possible discrimination against other employes in the state (a point which would not arise under a federal law, since the federal jurisdiction does not extend to non-hazardous industries), undetermined. It must, however, be borne in mind that the constitution does not require "a minute consideration of the distinctions which may arise from accidental circumstances as to the persons and things coming within the general class provided for", and that "there cannot be an exact exclusion or inclusion of persons and things". (*L. & N. R. R. Co. v. Melton*, 218 U. S. 36.) It is particularly important that some freedom should be conceded to the power of classification where the facility of administering a law is a controlling consideration, and it is clear that the elimination of the question of what constitutes a trade risk will remove a prolific source of litigation.³

IV. COMPENSATION THROUGH INSURANCE

The constitutional aspect of insurance is somewhat different from that of simple compensation. The difference may be stated by saying that in addition to dividing, between employer and employe, the loss resulting from industrial accident, insurance further distributes the share of the employer among all employers, or among all employers of the same class. Compulsory insurance may be looked upon either as an exercise of the police power, requiring a number of employers to join in a common plan for protecting their employes, or as an exercise of the taxing power, levying contributions from the members of a class for the purpose of relieving distress resulting from their occupation and distributing those contributions among the sufferers.

³ Much will depend upon the interpretation placed upon the words "arising out of and in the course of the employment." The doubts regarding the justice of the liability which have been suggested, will be practically removed, if the courts in applying the act require that the injury must be due to some risk peculiarly incident to the employment. Such seems to be the tendency of some recent English decisions. See *Amys v. Barton*, 1912 I K. B. 40, where the driver of a threshing engine was stung by a wasp and died of blood poisoning; it was held that he was not entitled to compensation under the act.

If compulsory compensation is held valid it may be well urged that compulsory insurance should be likewise held valid upon the theory that the power to impose a duty carries with it the power to compel the adoption of appropriate and reasonable arrangements which alone can insure the prompt and regular discharge of the duty. It is perfectly well known that compensation without insurance would either be practically inoperative or work injustice, hardship or ruin in many individual cases. The whole matter of liability for accident, whether common law or statutory, whether based on fault or not, can never be satisfactorily dealt with on a purely individualistic basis, since the possible consequences of an act may be entirely disproportionate to the relation entered into by the parties or to any fault of theirs; the only adequate solution of the problem, as has been recognized in Germany, lies in the social principle of insurance. Theoretically, however, insurance is less just to the employer than liability to compensation, since it makes him amenable to losses which he has not only been careful to avoid but successful in avoiding; and a strong argument has been made against the practical operation of state insurance, as compared with the coöperative insurance of Germany. (See the brief of Mr. W. T. Sherman submitted to the Federal Employers' Liability and Workmen's Compensation Commission, pp. 590-609.)

As a measure of taxation, compulsory insurance encounters difficulties in many states from specific constitutional limitations upon the exercise of the taxing power. But the Supreme Court of Washington was of the opinion that the tax of that state might be sustained as a license tax. Considered as an exercise of the taxing power, compulsory insurance against the consequences of industrial accidents may even be held to fall within the power of federal legislation. (See the brief of Mr. Miles M. Dawson in the *Survey* of August 5th, 1911.) In connection with a federal law, however, the question would arise at once: How could such a law protect the employer against common law action by the injured employe in the state courts? Not only is such a right of action entirely beyond the control of Congress, but under a number of state constitutions it is also beyond the power of the state legislature to abolish it. It is true that the payment of federal insurance might be made dependent upon the execution of a release of all rights of action under state law; but there would be nothing to prevent a state from de-

claring such a release to be inoperative, and Congress would be powerless against such legislation. The mere possibility or probability of voluntary coöperation on the part of the states would not be a sufficient answer to the objections drawn from the inadequacy of federal power. There is no immediate prospect, however, that this question will become practical.

GENERAL DISCUSSION

C. H. CROWNHART, *Chairman, Wisconsin Industrial Commission*: The problem confronting the states having compensation acts is: How can such acts, whether compulsory or elective, be made to apply to railroad employes who are not covered by the federal liability act or by the proposed federal compensation act? The federal liability act covers only such cases of injury as arise while the employe is engaged in interstate commerce and while the carrier is conducting the same kind of commerce. The proposed federal compensation act applies to common carriers by railroad engaged in interstate or foreign commerce, and to employes of such common carriers sustaining personal injuries by accidents arising out of and in the course of their employment while they are employed by such carrier in such commerce.

The law is not settled under the federal liability act as to when an employe is engaged in interstate commerce or as to when a railroad is engaged in such commerce. It is a question of law and of fact in each case and the opinions of the lower courts are widely divergent. There can be little reason to expect the law to be settled on the subject for many years. It is evident that an employe of a railroad company may be engaged in interstate commerce one moment and in intrastate commerce the next; he may be engaged in interstate commerce one day and in intrastate commerce the next; he may be engaged in interstate commerce one moment and the next moment he may not be engaged in commerce at all. At present, under the same state of facts, the courts of one jurisdiction may hold the employe engaged in interstate commerce, and the courts of another jurisdiction may hold the employe not engaged in any commerce.

All the courts hold that, in the absence of federal legislation, the states may legislate under the police powers as to liability, whether the employe is engaged in interstate or in intrastate commerce. But the decisions are uniform that federal legislation over interstate commerce supercedes state legislation over such commerce. All the courts hold that under the interstate commerce clause of the federal constitution Congress has no power to legislate over intrastate commerce. The decisions under the Wilson Act concerning interstate liquor transportation hold, moreover, in effect, that Congress may renounce its jurisdiction over such interstate commerce,

leaving it to state control. In the same way, no doubt, the federal Congress may renounce its liability control and leave the subject to state control.

In order that all employees of railroads may have the benefit of state or of federal compensation acts, Congress should delimit between its control and state control. The federal act should cover such cases as are clearly interstate and leave to state control all cases of doubtful jurisdiction, as well as those cases clearly within state jurisdiction. This can be done by careful classification. To begin with, shopmen and section-men should be left out of the federal act. They are seldom engaged in interstate commerce in fact. Car checkers, trackmen, and office employees can better be left to state control. Employees of railroads having their terminals wholly within a state should be left to state control in order to cover doubtful cases. In states having compensation acts it should be permissible for employees of railroads to elect to come under the state act.

Working along these lines, using due care in drafting the federal act, the great uncertainty of the present remedies for injuries to railroad employees may, I believe, be practically eliminated. The desideratum is certainty of jurisdiction and certainty of relief. The present uncertainty of jurisdiction works great hardship to the employee and multiplies litigation.

GOV. TEATS, *Attorney, Tacoma, Washington*: I am very much interested in the movement for compensation for injured industrial workers, and especially in that of the East, and of states other than the state of Washington where I live; because we think we have the model compensation scheme for all other states to copy and follow. Several states have had commissions that have made wide inquiry into the subject and issued many volumes of reports. Volumes of information have also been issued by England, Germany, and other countries. Individuals and associations, too, have written many volumes giving information on all phases of the several systems of Europe, on conditions under our old common law system, and on the working of casualty companies in this country. And yet very few states have compensation acts which will compensate, and several which have investigated the most and accomplished the most and compiled the most literature on the subject have done nothing else.

Three of us Washingtonians who lived at Tacoma and were in-

terested in sociological affairs happened to meet after luncheon one day in July, 1910, and the question arose as to whether or not it was about time for the state to have a compensation law. We all agreed it was, and proceeded to act. We had the commercial club call a public meeting of all workmen and employers who wished to attend; special invitations were issued to prominent employers and workmen; and to give the affair a sort of official color, we invited Governor Hay to preside. About two hundred and fifty interested employers and workmen joined the meeting and discussed for two days all the phases of conditions and systems. It was finally arranged that a commission should be appointed by the governor to draw up a bill to be presented to the legislature, which was to convene in the following January. The commission, consisting of six workmen and six employers, soon organized, employed one of the best constitutional lawyers, and proceeded to work. I acted with the commission as sort of *amicus curiae*.

The July meeting had decided that some bill should be drawn; and the first question was which plan to adopt,—compulsory state insurance; compulsory compensation by employers, allowing them to insure (the English system); or the elective system. In our state the casualty company had become a menace,—fighting first the injured and, when a verdict was rendered against the assured employer, then fighting the assured. The employing companies wanted to be relieved of such injustice to their workmen and to themselves and of the uncertainty as to their insurance. The workmen demanded that all injured employes be paid, without the intervention of casualty company, lawyer, or court. The elective system would not give relief from the casualty company, although it might run the gauntlet of our courts on constitutional grounds. The compulsory English system imposing direct burden on the employers also retained the casualty company as administrator, and might run amuck the due process clause of our constitution. But compulsory insurance, with the state as administrator, would eliminate the casualty company, the lawyer, and the court, and fall within the rule of the banking indemnity cases. The Washington law is the latter plan worked out to the best of our ability. Experience will suggest changes, it is true, but the main plan will not be changed, I believe. The law has withstood the constitutional test in our state supreme court, and we all believe will stand the test of the Supreme Court of the United States. If you want a law that must work justice to

all parties concerned and be declared constitutional because just, model your compensation act on the Washington plan.

MILES M. DAWSON, *Counsellor-at-Law and Consulting Actuary, New York City*: The topic for this evening is broad enough to embrace all that has been said upon the various phases of workmen's compensation, but I shall address myself chiefly, if not exclusively, to the narrow construction of the topic, *viz*, the relation between state and national systems or methods of compensation. We are, unfortunately, dealing with the workmen's compensation question in about fifty different territorial districts, that is, states, territories, the District of Columbia, and provinces or colonies. In consequence, we are certain to have a great complex or even conglomeration of statutes, each one differing from the other in minor matters, and most of them differing in important matters. In addition to this, if the present plans do not miscarry, we shall have national laws regulating the liability of railway companies to their employes and of the government to its employes. Shortly, also, we must necessarily pass laws similarly providing for compensation for the employes of other interstate commerce carriers, and perhaps eventually of all who are engaged in interstate commerce.

All sorts of complications, for the most part as yet utterly unforeseen, must necessarily arise from the inconsistent provisions of the various state laws. Thus already in certain industries the insurance rate covering the liability of the employer is from ten to twelve times as high in Camden, N. J., as across the river in Pennsylvania. There will also be much confusion in the minds of workingmen, who can scarcely be expected to have in mind the fact that, if working in Camden for an employer who has not declined to accept the provisions of the New Jersey law, they are covered against all accidents; while if they should be injured when working in Philadelphia the chances would be nearly ten to one that they would have no claim whatever. This is not a pleasant picture for our own citizens to contemplate, and still less agreeable is it when one appreciates that, in consequence, we shall long be at the same moment the most illiberal country in the world in these respects, and, let us hope, after a time the most liberal country, according as we are judged by the law of one state or the law of another.

There must soon, moreover, be very unpleasant issues in the courts as regards where the limits of the power of the national government

are to be found,—to which point, of course, the power of the state extends. Thus, for instance, is the employe of an interstate railway company engaged in interstate commerce by reason of such employment, or only by reason of 'actual employment in interstate transactions and while thus employed? If the latter, will he be covered by the federal law if he is not at the time of injury engaged in interstate commerce? The proposed federal law purports to supersede wholly the remedy given by a state law to its citizens and residents, whether for negligence or under a compensation act. Whether it purports to exclude benefit under a state insurance act is questionable. If employers pay or offer to pay under the federal law, then, will it or will it not be recognized as an offset to liability under state laws in case it is held that the federal law does not wholly supersede them? Can the proposed federal law, as it seeks to do, deprive a workman of his right to sue another interstate commerce railway company for an injury caused by its negligence, and bestow that right upon his employer?

It is probable that these difficulties will after a reasonable time adjust themselves under any system which we may adopt. If, for instance, as I have elsewhere suggested, we were to adopt a worthy national system under which, out of funds raised by compulsory contributions from employers or from employers and employes, all industrial accidents throughout the entire country would be compensated, undoubtedly we could protect this fund, in case the employe was permitted to collect elsewhere, by providing for offset, and, in my opinion, also for subrogation; and it is not within reason to suppose that state courts and state legislatures, if need be, would not protect their citizens against being required in effect to pay the second time, by permitting evidence to be adduced to show the diminution of damages by reason of compensation under the federal act. That is, after a shorter or longer period, the state laws would be modified and confined only to cases where criminal liability existed, in which cases the damages would be made punitive and exemplary. Something akin to this will necessarily come out of the play, back and forth, of the various state and federal experiments in legislation, however numerous and complicated they may be. But it will take time, cause much trouble and expense and result only in a tolerable patch-work system, if legislation is to be by states; and, in the end, state legislation must, in my opinion, give way to an economical and efficient national system.

II

UNIFORM REPORTING OF INDUSTRIAL INJURIES

Joint Session with the American Statistical Association,

FRIDAY MORNING, DECEMBER 29, 1911.

Presiding Officer: CHARLES P. NEILL

Commissioner, United States Bureau of Labor.

WASHINGTON, D. C.

REPORT OF SPECIAL COMMITTEE ON STANDARD SCHEDULE FOR REPORTING OF INDUSTRIAL ACCIDENTS

LEONARD W. HATCH, *Chairman.*

Chief Statistician, New York State Department of Labor.

In order to report in full on the work of this committee it may be worth while to refer briefly to the origin of the committee and the action which has been taken by it, by way of preliminary to a presentation of the results of its work and the considerations which have led to the conclusions reached.

REPORT OF WORK DONE

To the best of the writer's recollection the origin of the committee goes back to a conversation last June between the secretary of the Association and the writer. An allusion by the writer to the present lack of uniformity in accident statistics as presenting a problem demanding attention, particularly in view of the immediate prospect of rapid development of such statistics in different states under the stimulus of the growing attention now being given to the accident problem, led the secretary to suggest that this subject might very appropriately be taken up by the Association for Labor Legislation and to propose that the matter be discussed at the Chicago conference of the Association in September. This was accordingly done, and one session of the conference (on September 16) was devoted to the subject of the reporting of industrial accidents. At the morning session the problem of uniformity was considered in its general aspects, and as a plan for practical action it was proposed that a round-table conference scheduled for the afternoon should begin work at once on the formulation of an accident schedule and that, if necessary, the Association, as the most appropriate agency for the purpose, should appoint a committee to continue to completion the work of the afternoon conference. The discussion of the morning session resulted in the passage of a resolution for the appointment of such a committee, in accordance with which the committee whose report is presented to-day was named.

The afternoon conference at Chicago, which was attended by a considerable number of state officials, representatives of liability insurance companies, and others specially interested in accident problems, took up the general question of the scope of the proposed schedule as to subject matter, discussing point by point a list, previously prepared by the writer, of all the principal items of information to be found in any of the existing schedules of state departments then collecting accident statistics. At this conference a number of the items in this composite list were settled for inclusion in or exclusion from the schedule. Others there discussed, as well as those not reached for lack of time, together with all matters relating to form of inquiries, were referred to the committee, which had already been appointed by the president of the Association, for further consideration and final determination.

After the Chicago conference the chairman of the committee proceeded to formulate, as a starting point for discussion, a complete schedule embodying the conclusions there reached, together with tentative conclusions on the points not settled. This draft was then taken up at a meeting of the committee in New York on October 27, attended by Messrs. Andrews and Chaney, the chairman, and Mr. David Van Schaack, who kindly consented to give the committee the benefit of his knowledge and experience as director of the bureau of inspection and accident prevention of the Aetna Insurance Company.¹ All the points for a complete tentative draft of a schedule were discussed at this conference, and the conclusions reached were embodied in the printed draft which most of you have received or have before you.

Early in November this tentative draft was widely circulated among those who might be interested or might have special knowledge on the subject, both state officials and others, with a request for criticisms. The response to this request has been gratifying, and a large number of letters suggesting amendments have been received. Unfortunately the members of the committee are so widely scattered as to residence, or have been so busy with other

¹ The committee wishes also to note special assistance received from Mr. Frederick Hoffman of the Prudential Insurance Company, in the form of numerous suggestions made in a conference with the secretary and chairman in New York in August when the plans for the Chicago conference were being considered, at which time an outline of a schedule was gone over in detail.

REPORT OF ACCIDENT TO EMPLOYEE.

November 4, 1911.

Part I.

EMPLOYER, PLACE AND TIME	Employer's name _____
	Office address: Street and No. _____ City or village _____
	Business (goods produced, work done, or kind of trade or transportation) _____
	Location of plant or place of work where accident occurred, if not at office address: Street and No. _____ City or village _____
	Date on which accident occurred _____ Hour of day _____
THE INJURED PERSON	Name _____ Address _____
	Sex _____ Age _____ Speak English? _____ If not, what language? _____
	Occupation when injured (state whether regular occupation or not, and also name department or branch of work to show where injury was received) _____
	Length of experience (here and elsewhere) in this occupation _____
	Place or time worker? _____ Wages, or average earnings, per day _____ Working days per week _____
THE CAUSE	Name of machine, tool or appliance in connection with which accident occurred _____
	Hand or mechanical feed? _____ Part on which accident occurred _____
	Describe in full how accident happened _____
THE INJURY	State fully nature and extent of injury _____

MEDICAL ATTEN- DANCE	Attending physician, or hospital where sent: _____
	Name _____ Address _____

Part II.

NOTE.—Extent of disability is to be reported at time of first report if then fully known; if not, detach Part II after filing in names for identification, reserve for (two?) weeks and then send in the report on disability.

	Name of employer _____ Name of injured person _____
EXTENT OF DISABILITY	Did injury result in death? _____ If not, has it caused—
	a. Permanent total disability (meaning inability to do any work)? _____ If so, state nature of permanent injury or condition causing such disability _____
	b. Permanent partial disability (meaning ability to do some work but not of same kind or amount as before accident)? _____ If so, state nature of permanent injury or condition causing such disability _____
	On what date was work resumed? _____ Present wages, or average earnings, per day at such work _____
	c. Temporary disability (meaning that injured person has been able to resume same kind and amount of work as before accident)? _____ If so, for how many working days did such disability last? _____
	d. Disability the extent of which is not known two weeks after first report? _____
	If so, state estimated period of disability _____
	<i>In this case the employer is expected to keep a record from which report of ultimate extent of disability can be furnished when requested.)</i>
	In case injury caused death or permanent total disability as shown above, give name, address, age and relationship of each person dependent on injured person's earnings:
	Name _____ Address _____ Age _____ Relationship _____

REPORT OF ACCIDENT TO EMPLOYEE.

December 29, 1911.

Part I.

To be filled out and sent in within 48 hours of the accident.

1. EMPLOYER, PLACE AND TIME	a. Employer's name _____ b. Office address: Street and No. _____ City or village _____ c. Business (goods produced, work done, or kind of trade or transportation) _____ d. Location of plant or place of work where accident occurred, if not at office address: Street and No. _____ City or village _____ e. Date on which accident occurred _____ f. Day of week _____ g. Hour of day _____
2. INJURED PERSON	a. Name _____ Address _____ b. Sex _____ c. Age _____ d. Speak English? _____ If not, what language? _____ e. Occupation when injured _____ In what department or branch of work? _____ Was this regular occupation? _____ f. Length of experience (here and elsewhere) in occupation when injured _____ g. Place or time worker? _____ h. Wages, or average earnings, per day _____ i. Working days per week _____ j. Hour at which injured person began work on day of accident _____
3. CAUSE	a. Name of machine, tool or appliance in connection with which accident occurred _____ Driven by mechanical power? _____ Hand fed or mechanical feed? _____ Part on which accident occurred _____ b. Describe in full how accident happened _____ c. Had injured person been instructed as to danger of his work? _____ d. What guard, safety appliance, or regulation against the danger indicated by this accident was in use when accident occurred? _____
4. NATURE OF INJURY	a. Part of person injured (state whether right or left in case of arms or hands) _____ b. Nature of injury, exactly _____ c. Attending physician or hospital where sent: Name _____ Address _____
Date of report _____ Made out by _____	

Part II.

This Part is to be filled out and sent in with Part I if extent of injury and disability are then fully known; otherwise detach Part II after filing in names for identification and fill out and send it in after two weeks.

5. EXTENT OF INJURY	Name of employer _____ Name of injured person _____ a. Did accident cause death? _____ b. Has it caused any permanent physical injury? _____ If so, state its nature exactly (see instructions on back of this Part) _____
6. AMOUNT OF DISABILITY	a. Has injured person returned to work? _____ If so, on what date? _____ At what occupation? _____ and wages per day? \$ _____ b. If injured has not yet returned to work, state probable length of idleness on account of accident _____
Date of report _____ Made out by _____	

Part III.

Part III is to be detached when Part II is sent in and used for reports of any of the following events subsequent to sending in of Part II: (a) death; (b) development of any permanent injury; (c) return to work; (d) subsequent idleness after first return to work. Fill in names before detaching.

7 EXTENT OF INJURY	Name of employer _____ Name of injured person _____ a. Death resulted on (give date) _____ b. Permanent injury resulted as follows (see instructions on back of this Part) _____
8 AMOUNT OF DISABILITY	a. The injured person returned to work for the first time after the accident on (give date) _____ and at daily wages of \$ _____ b. Idleness subsequent to first return to work occurred from (give date) _____ to (give date) _____ On the latter date the injured person returned to work at the occupation of _____ and at daily wages of \$ _____
Date of report _____ Made out by _____	

duties at this season of the year, that it has as yet been impracticable to arrange a meeting of a quorum to consider the criticisms and suggestions received. In lieu of such a meeting, the chairman has undertaken the task individually, and as a result there is presented herewith on behalf of the committee a revised draft of the schedule for consideration, with the first draft, at this meeting. This revision represents the result of a careful weighing by the chairman of all the suggestions and criticisms which have been received, in the light of previous discussion by the committee of the same or similar points in connection with its first draft, or according to his own judgment on amendments not heretofore specifically weighed by the committee. The revision is presented, not as necessarily final at all points, even in the chairman's view, nor still less perhaps in that of the other members of the committee, but as a tentative revision representing the latest development of the schedule upon which to focus the discussion of this conference.

So much for the report as to the origin of the committee and the method of its work.

It is the desire of the committee to have quite fully presented in this report the principal considerations which have led it to the conclusions represented by the draft of a schedule before you. This will be done by noting first certain general considerations or guiding principles which the committee has endeavored to follow, and then by taking up the schedule itself, first considering its general plan and afterwards its details.

GENERAL CONSIDERATIONS BEARING ON THE SCHEDULE

First. The schedule is designed to be used by any government office which has occasion to collect reports of industrial accidents. This means specifically, statistical bureaus, factory inspectors, and compensation commissions. The use to be made of accident reports by each of these is not precisely the same as respects the scope of the information desired, the form in which it is desired, or the degree of accuracy required in the reports. So far as statistical bureaus and compensation commissions are concerned, the principal difference between them is as to the scope of the information desired. The general statistical bureau is desirous of securing statistical information concerning all aspects of accidents, while the compensation commission is interested primarily only in the items of

extent of injury and extent of disability. There is a difference as to subject matter, however, between the needs of these two agencies and of factory inspectors, who are specially interested in the causes of accidents. From the point of view of factory inspection, or more broadly of prevention of accidents in general, there is a demand for inclusion in schedules for accident reports of certain inquiries which are not calculated to produce information adapted either as to form or accuracy to statistical purposes, but which may prove valuable as clues for administrative purposes or in calling the attention of employers to the requirements of safety laws or to possibilities of prevention.

Second. The schedule is designed to be filled out by employers and sent in by mail. Consideration must be given, therefore, to the opposition of interests almost inevitably felt by an employer over against an injured employe as a possible claimant of damages or compensation, and over against a state office concerned either with the enforcement of safety or compensation laws or with the making of such laws, and to whether this natural prejudice of the employer is likely to vitiate the accuracy of answers to any given question so far as to make it useless for statistical purposes.

Third. The schedule is designed for use by state agencies which vary widely in resources available for statistical work. Hence it has appeared wise, so far as statistical purposes are concerned, to limit the questions in general to the more fundamental facts, which are significant in the simpler statistical forms, rather than to include every possible item which it might be worth while to cover in the most elaborate statistics of accidents. In the interests of uniformity a basic schedule for the fundamental items is deemed more practical. This may be supplemented at any time, if any individual office so desires, by the addition of items or by special inquiries.

Fourth. In addition to these general considerations especially applicable to an accident schedule, two or three general statistical rules may be mentioned as particularly applicable to the problem in hand, either because of the considerations above referred to or for other reasons. One of these is that a question calling for objective facts from which the investigator may draw conclusions is safer than one asking the informant for the conclusions. Another is that it is preferable to call for the primary data from which a computation

may be made in the office rather than to call for a computation made by the informant. A third is that a general question calling for a full statement on a specific point may be more effective as well as simpler, than a series of questions on various phases of the point to be categorically answered.

THE SCHEDULE

With the foregoing statement of work done and notation of general considerations, the schedule itself stands as the chief part of the committee's report, and this is in your hands. It may be of assistance, however, to make some explanation of the committee's, or the chairman's, reasons for some features of the schedule as presented.

First, then, as to the general plan, more particularly the three-part arrangement.

General Plan

The general scheme of the schedule contemplates (1) immediate, or practically immediate, report of every accident, in which shall be covered all those points deemed desirable concerning which the facts are ascertainable at the time of the accident; and (2) supplementary reports for those facts not immediately ascertainable at the time of the accident. The schedule is accordingly divided into parts—Part I to serve for immediate reports, and Parts II and III for the later supplementary reports. Speaking generally, Part I deals principally with the causes, primary or secondary, of the accident, together with necessary data for classification or administrative purposes, while Parts II and III deal with the results of the accident.

Beyond question the most difficult subject to deal with in an accident schedule is that of results, so that it will be worth while to set forth more at length the considerations which have led to the provision of a separate portion, itself in two separate parts, for results,—that is, for extent of injury and amount of disability, the principal results concerning which information is needed.

The source of difficulty connected with these items in an accident schedule is principally the fact that definite information on these points, except in the most trivial cases, cannot be had at the time of the accident, but must be gotten at various periods of time thereafter as the ultimate effects of the injury develop. This difficulty is further aggravated by the fact that in many cases the accident

results in a severance of the relation of employer and employed, so that the former loses track of the latter entirely and can give no information as to the ultimate effects of the accident. The latter fact renders it absolutely impossible to secure complete returns as to extent of injury or amount of disability solely from employers, and in this class of cases the only resort is to special inquiry of hospitals, physicians, the injured persons, or their families. For such a special inquiry, however, it is not necessary to provide here where the problem is only to furnish an adequate schedule to secure the information when it is in the employer's possession.

The indefiniteness of the time when extent of injury and amount of disability can be known, coupled with the fact that unquestionably from every point of view the first report of an accident should be required immediately or within a reasonable allowance of time for making out and mailing, makes it absolutely necessary to provide for some form of supplementary report. Three alternative methods of dealing with this problem may be considered: (1) Owing to the inherent difficulties connected with it, abandon these two items in the standard schedule, leaving it to individual offices to take up the matter in their own way, if desired; (2) provide for a single supplementary report to be made either at a definite time after the first report or whenever in any case final developments may become known prior to that time, leaving those cases not fully developed at the end of the fixed period to be completed by special inquiry; (3) provide for two supplementary reports, one to be made in every case at a fixed time after the first report, the other at whatever later date the final developments become known.

So far as the first alternative is concerned, it may be dismissed on the simple ground that to adopt it would be to abandon the effort for uniformity at one of the most important points so far as general statistics of accidents are concerned, and at the point where compensation commissions are most interested.

It will be seen that in the first draft of its schedule the committee presents the second alternative, while in the revised draft the third is adopted. With reference to these two it may be noted that the third is not a substitute for the second but rather a supplement to it, designed practically to cover those cases which under the second would be left to each office to handle in its own way. The third alternative represents, therefore, the necessary addition to provide

fully for complete reporting (so far as that lies within the power of employers alone) of extent of injury and amount of disability. This is the ground for adding Part III in the revised draft.

Any consideration of supplementary reports immediately suggests the problem of insuring that such reports shall be sent in. This problem, like that of insuring that first reports shall be sent in, lies beyond the province of this committee except in so far as the period fixed for the sending in of Part II has a bearing on it. The period of two weeks which the committee has adopted is, of course, largely arbitrary. Since the tentative draft was sent out, opposing criticisms of this period have been received. It has been suggested that two weeks is too long a period; also that it is too short. In fixing upon any period, two general considerations, pointing in opposite directions, have to be taken into account. On the one hand, the longer the period the more likely the employer is to overlook or forget the supplementary report entirely; on the other hand, the shorter the period the larger the number of cases which cannot be reported within it because ultimate results are not yet known, necessitating a second supplementary report. As between these two considerations it may be noted that the second tends to become less weighty if provision is made for a second report when ultimate results are known. Another practical consideration is that the success of any plan for supplementary reports must depend upon careful follow-up work by the office receiving the reports. On the whole, therefore, it has seemed best to adopt a fairly short period, at the end of which a second statement shall be required for all cases incomplete on first report. The fact that it is common in compensation acts to exempt the first two weeks of disability from benefits, easily suggests that period as appropriate for the purpose, and such period has seemed on the whole most satisfactory.

Details.

Turning to details of the schedule, while there is hardly time or necessity for discussion of each individual item in the schedule, it will be of assistance, perhaps, to give the reasons for certain items as they stand. In this connection the differences between the tentative and revised drafts may also be explained.

1. Employer, Place and Time.

The points in this group present, perhaps, no special problems. "d. Location of plant or place of work when not at office address,"

is important in the case of large manufacturing firms with more than one plant, reporting accidents from a central office; but it is most important in some other industries, such as building and transportation, where the employer's office (necessary for purposes of correspondence) is usually separated from the place of work. "c. Business" is, of course, of utmost importance for proper classification of accidents by industries. It might be thought worth while to elaborate this question. But it is to be considered that in the case of manufacturing, where the classification problem is most serious, bureaus of factory inspection and bureaus of labor statistics usually have other sources of information on the point. Further, in the case of a large firm with a considerable number of accidents, to require answers to several questions concerning the nature of its business would mean an enormous duplication of information which is entirely sufficient when secured once only. It may be noted that this information can always be very easily corrected or supplemented by correspondence when a new firm begins to report.

The "day of week" has been added in connection with the date (e) in the revised draft simply as a matter of economy of time in tabulation,— as saving the tabulator the time necessary to determine the day of the week by the date, and as being perfectly easy for the employer to supply at the time of the accident. The items "day of week" and "hour of day" are designed, of course, to afford statistics of frequency of accidents according to day or hour, which may have a bearing upon the relation of fatigue to accidents.

2. Injured Person.

It is hardly necessary to give reasons for including the name and address of the injured person, needed to identify the accident, and the fundamental characteristics of sex and age, both the latter having long been recognized as significant in factory laws, by special regulations for the safety of women and children. One matter incidental to the inclusion of the name and address of the injured person has had to be considered by the committee, however, and should be noted here. This is the question of preserving secrecy in the reports, so that they may not be utilized to support claims for damages against the employers making them. The latter may be done either by regular legal process calling for the reports as evidence in suits, or by "leaks" in the state office receiving them whereby lawyers secure knowledge of cases in which to stir up

claims or suits. In one state this danger has led to the omission of the name of the injured person from the reports, and in another to the device of a detachable stub for such name, which can be removed immediately on receipt of the report, duplicate numbers serving for identification of the parts. But in a number of states this difficulty, so far as it is real, has been practically eliminated by prohibiting by law the use of any accident report as evidence in a suit for damages. Such a law is in the committee's opinion a desirable adjunct to a reporting law and represents the best method of dealing with the problem referred to. So far as the uniform schedule is concerned, it is accordingly deemed best to include the name of the injured person. In any case an individual office could easily omit the item, or adopt a stub device, without a serious exception to uniformity.

The question as to language spoken (d) requires some explanation. The question is designed to be of aid in the problem of proper instruction or warning of non-English-speaking employes as to dangers, rather by way of suggestion to employers or administrators than as a source of valuable statistics. A natural query which arises, perhaps, is—why a question as to ability to *speak* English when ability to *understand* it is the real question? The reply to this query is that what is really wanted is to know in what language an employe must be instructed as to his employment to be sure he will clearly understand its dangers, and that the simplest and most reliable test of an uneducated person's ability to clearly understand a language is ability to speak it. An employer's assertion that an alien laborer could understand English when he could not speak it, would certainly be more open to question than the inference that the language spoken is probably the only one clearly understood. What is the man's language is the real question; and the most direct and usual test of this is—what language does he speak?

The inquiry as to occupation (e) appears in different forms in the two drafts submitted, but it will be seen that its scope is the same, the parenthetical portion in the tentative draft being put in separate inquiries in the revised draft. The committee considered the latter form originally but by a majority decided in favor of the condensed form. Criticisms and suggestions on this point received later, however, have dictated the adoption of the more extended form as more likely to secure exact designation as to occupation.

The hour at which the injured person began work on the day of the accident (j) has been added in the revised draft, following a suggestion made to the committee by one especially interested in the question of fatigue as a cause of accidents. On this point statistics based on the length of time the injured person had been at work, which this question makes possible, are of course more exact than the closely similar figures for the number of accidents occurring in different hours of the day. As a matter of fact, this question is taken verbatim from the accident schedule used by the British factory inspector.

3. Cause.

a. The question as to whether a machine or tool is "driven by mechanical power", is another one originally considered by the committee and voted out by a majority, but later restored to the revised draft in response to outside suggestion. The item is, perhaps, most important in connection with certain classes of power-driven movable tools (such as riveters) which are coming more and more into use.

c. and d. These two items were added to the revised draft in response to similar suggestions from a number of different sources. They are likely to suffer too much, in the answering by employers, from natural defensive prejudice (as bearing on questions of negligence or infringement of safety laws) to afford reliable statistical material. But a number of administrators of safety laws, particularly, regard it as essential that inquiry as to preventive measures employed should be included, partly for their educational effect upon employers and partly as more or less useful clues in connection with the enforcement of safety laws. Regarding preventive measures as falling generally into one of three classes (instruction as to danger, safety devices, and rules of work), it is believed that the two inquiries cover the subject adequately without burdening the schedule with a series of inquiries which, were the subject elaborated, would have to be quite extended to be exhaustive. This appears to be a point on which a general inquiry is preferable to a list of all its phases.

4. Nature of Injury.

a. and b. It will be seen that the scope of this topic in Part I is more limited in the revised draft than in the tentative form. This is due to the relegation to Parts II and III in the revised

draft of "extent of injury". As already explained, extent of injury, except in the most trivial cases, is not ascertainable at the time of the accident, so that if complete information on that subject is to be had it properly belongs in the supplementary report.

With extent of injury assigned to Parts II and III, the inquiry is elaborated in the revised draft so as to insure more exact return of "part of person injured". In this connection it has been suggested that greater exactness could be attained by use of an outline figure of the human form on the back of the schedule, on which the exact location of the injury could be marked. It seems on the whole, however, aside from the fact that the space on the back is really needed for other matter essential to a schedule in the best official form, that there is no reason why a statement in answer to question "a" (unless very carelessly made) should not afford sufficiently exact information on the point, and it is believed that practical experience with accident reports bears out this conclusion.

c. The inquiry as to physician or hospital has been given a less prominent position in the revised draft, as an item under "nature of injury". While not altogether logical, this position is deemed preferable when it is considered that the purpose of the inquiry is simply to make available additional means of information concerning the nature or the extent of injury.

5. Extent of Injury.

Here a very radical change has been made in the revised draft. One criticism made of Part II in the tentative draft was that as it stood it would not necessarily elicit information as to permanent injuries which did not cause any permanent disability. For example, if a carpenter lost the sight of an eye in an accident, the ultimate extent of injury not being apparent when Part I was sent in, and later returned to his former work and wages, which would be perfectly possible, the inquiries in the tentative draft would not bring out the fact of the lost eye. As a matter of fact the number of permanent injuries of this sort,—that is, which do not cause permanent disability,—is not inconsiderable, so that this criticism appeared convincing if a schedule was to be devised which would afford complete statistics of extent of injury. The only effective way to remedy this defect seems (to the chairman, at least) to make extent of injury the subject of a special inquiry. What is really

wanted under the subject of "extent of injury" is whether (1) the injury proved to be fatal or (2), if not fatal, whether it was in any degree permanent. Accordingly questions "a" and "b", covering these two points, have been inserted in the revised draft under "extent of injury". But what constitutes "permanent" injury is a question susceptible of very different interpretation by different employers, as the practical experience of those who have handled accident reports covering that point abundantly proves, so that to secure anything like uniformity of interpretation it seems necessary to include in the schedule a definition of the term. For this the chairman has drawn upon his own experience in New York State and has adopted the definition appearing upon the back of Parts II and III verbatim from a special supplementary report used by the New York Bureau of Labor Statistics during the last year.³

6. Amount of Disability.

Here is the most revolutionary change offered in the revised draft as compared with the first form. The occasion for it was a criticism of the tentative draft on this point received from the same source as that above noted respecting extent of injury. This was to the effect that it was a mistake to ask employers concerning permanent disability first, and then to ask them for a statement of the permanent injury causing such permanent disability, since this was too much in the nature of asking for conclusions instead of for objective facts from which to draw conclusions. By way of reply it might be said that the ultimate information really wanted is extent or amount of disability,—that is, the effect of the injury on the employe's capacity for work,—and that it was precisely this which the committee was aiming at in the tentative draft by inquiries covering separately the three classes of disability which it is necessary to distinguish (permanent total, permanent partial, and temporary); and further that each one of these classes was clearly defined in the schedule. But the criticism, which was on the whole the most important received on the entire schedule, nevertheless deserved careful consideration, the more so because it is true that extent or amount of disability is one of the inevitable bones of contention in an accident under compensation as well as under liability

³ This definition does not appear with the revised draft reproduced in earlier pages, but may be seen on the back of the final draft presented herewith.

laws, and is consequently specially liable to the influence of prejudice in an employer's report on the point.

The desirable revision suggested by the criticism referred to was the substitution for direct statements by the employer of amount of disability, of statements of objective facts not involving conclusion or interpretation by the employer but from which amount of disability could be accurately deduced and measured. The result of the chairman's study of this problem is presented in the questions under "amount of disability" in the revised schedule. By way of explanation, it may be observed in passing that the revision as to "extent of injury" provides for a return of every permanent injury, which is one objective fact furnishing an important clue to disability. For if no permanent injury results from an accident it is certain that disability is only temporary. On the other hand, every permanent injury may, though it does not necessarily, cause permanent disability, and in certain cases the nature of the permanent injury is such that permanent total disability is obvious.

But disability really concerns ability to work or earn wages. The objective tests of disability, therefore, really concern (1) the amount of idleness caused by the accident, or (2) the amount of reduction in earning capacity caused by it. As objective tests for these it is submitted that the dates of the accident and of return to work (with dates of beginning and ending of subsequent idleness when it occurs), together with statements of occupation and wages before and after the accident, constitute all that is practicably ascertainable with any degree of accuracy, and consequently afford as full knowledge of disability as can be secured short of special and continued investigation of each case. These are, accordingly, the items provided for in the revised draft for ascertaining amount of disability, not as affording a perfect measure of disability, but as on the whole the best practicable measure within the general limitations of this schedule.

Omissions.

The above with reference to what has been included in the schedule may perhaps properly be supplemented by a word or two as to some things deliberately omitted.

No questions have been included concerning the subject of negligence or moral responsibility for the accident. The reason for this omission was that, for statistical purposes, neither complete nor reliable information can be secured in such returns from the em-

ployer alone on a question which is so shrouded in uncertainty, or so much a subject of dispute and consequently so liable to prejudiced report.

No questions as to the amount of compensation or benefits received by injured workmen have been included. Information on this point cannot be afforded by employers alone in such reports, except in most fragmentary fashion, and the subject is of minor importance compared with the more fundamental questions as to causes, disability, etc.

Some of the compensation acts condition the amount of compensation in fatal and permanent disability cases upon the number of dependents of the injured person. For this reason a question as to dependents in such cases was included in the tentative draft. Criticism of this was made on the ground that such information often cannot be furnished by employers without special investigation. There is a further difficulty here, which practical experience in endeavoring to secure information on the point has revealed, in that for accurate returns what constitutes a "dependent" would have to be defined. For these reasons it has seemed best to omit this question in the revised draft, leaving the matter to be covered by special investigation when so desired.

Matters of Form.

It is hardly necessary to comment on matters of form, except to suggest that the question of providing for an employer's copy of each report by printing the face of the schedule in copying ink, or by providing a duplicate for carbon copy, may well be left to individual offices to determine for themselves; and to note that the spacing between lines, which may seem somewhat narrow even in the revised draft, has been made just equal to standard single space on typewriters, with the idea of facilitating use of the latter as desired by many firms.

CONCLUSION.

The work of the committee has made it very clear that, particularly when it comes to details, numerous points in such a schedule have to be decided finally by compromise, or by selection among many opinions with very narrow differences between them and often with the weight of evidence in favor of one or another not very clear. It therefore earnestly desires the widest criticism of the schedule which it submits as the main portion of its report, to the end

that the Association for Labor Legislation, in its work for the highest standards and for uniformity, may be able finally to recommend to offices handling such reports a schedule carrying the weight of the widest possible advice in its formulation. To this end further revision of the schedule is entirely feasible, if necessary. Otherwise, adoption of the revised schedule herewith submitted is recommended.

REPORT ON STANDARD SCHEDULE FOR REPORTING OF INDUSTRIAL DISEASES.

At the Chicago conference where this committee was appointed, the question of a uniform schedule for the reporting of industrial diseases by physicians, which recent laws in a number of states provide for, came up, and after some discussion was referred to this committee. On this subject, however, the committee as a whole has as yet been unable to take much action, all its available time having been devoted to the accident schedule, which naturally took first place. The chairman and secretary, however, have taken part in a conference under the auspices of the New York branch of the Association, which has been fortunate in having the coöperation of several members of the New York Academy of Medicine, as well as of others, in the work of drafting a schedule for use particularly in New York State. The schedule is being worked out with much care, and is equally adapted for use in other states. This committee recommends, therefore, that the schedule finally developed by the conference above referred to be adopted by the national Association as its standard schedule for the reporting of industrial diseases.

COMMITTEE.

LEONARD W. HATCH, *Chairman*, Chief Statistician, New York State Department of Labor.

LUCIAN W. CHANEY, Special Agent, United States Bureau of Labor.

JOHN R. COMMONS, Member, Wisconsin State Industrial Commission.

DON D. LESCOHIER, Expert, Minnesota State Bureau of Labor.

JOHN B. ANDREWS, *Secretary*, American Association for Labor Legislation.

GENERAL DISCUSSION

The report of the chairman was followed by remarks and suggestions from the other members of the committee present, Mr. Lucian W. Chaney, *Special Agent of the United States Bureau of Labor*; Professor John R. Commons, *Member of the Wisconsin Industrial Commission*; and Dr. John B. Andrews, *Secretary of the American Association for Labor Legislation*.

A long and interesting discussion followed, in which the following persons, among others, took part: the presiding officer, Charles P. Neill, *United States Commissioner of Labor*; Frederick L. Hoffman, *President of the American Statistical Association*; David Van Schaack, *Aetna Life Insurance Company*; H. W. Belnap, *Chief Inspector of Safety Appliances of the Interstate Commerce Commission*; Carroll W. Doten, *Chief Investigator of the Massachusetts Commission on Compensation for Industrial Accidents*; Edwin W. DeLeon, *President of the Casualty Company of America*; and Miles M. Dawson, *Consulting Actuary and Attorney, New York City*.

Among those present were Professor H. R. Seager of Columbia University; Mr. C. H. Verrill of the United States Labor Bureau; Mr. John M. Glenn of the Russell Sage Foundation; Professor C. R. Henderson of the University of Chicago; Professor S. M. Lindsay of Columbia University; Mr. C. L. Close of the United States Steel Corporation; Dr. E. Stagg Whitin of the National Prison Labor Association; Mr. Paul Kennaday, secretary of the New York Association for Labor Legislation; Mr. John Wallace, member of the Washington State Industrial Insurance Commission; Mr. Frank Drown of the Massachusetts Bureau of Statistics of Labor; Dr. Helen L. Sumner, of Washington, D. C.; Mr. Magnus W. Alexander of Lynn, Massachusetts; Mr. Horace Secrist of the Wisconsin Industrial Commission; Professor Ernst Freund of the University of Chicago; and Dr. John Koren, of Boston.

The speakers were agreed that the main purpose of a uniform schedule for the reporting of industrial accidents was to facilitate their prevention, and the secondary purpose to facilitate compensation for injuries. As one speaker put it, "It is an axiom among students of this subject that an accident prevented is a benediction, an injury compensated an apology."

There was some difference of opinion, however, as to whether such a schedule would accomplish these ends. Mr. DeLeon did not believe that the schedule would be adopted by the newer states in manufacturing, or that, if adopted, it would furnish the detailed information necessary for reliable statistics. "The next step," he feared, "in this plan for the adoption by the states of uniform accident schedules, is likely to be a proposed law requiring the liability insurance companies to report to bureaus of labor the information compiled by them respecting the extent of disability and the amount of settlements for accidents reported to them in each state. The furnishing of any such information would entail a great deal of additional labor and expense on the part of liability insurance companies, which are already overburdened by state requirements." He urged, therefore, that attention be concentrated on the strengthening of inspection departments, and on the passage of laws which, like those establishing boards of boiler rules in Massachusetts and Ohio, would "strike at the root of this question" by removing "the causes of these accidents at the place where the first and greatest danger lies,—namely, in the construction of machinery and devices used for manufacturing and commercial purposes."

Other speakers, however, pointed out (1) that, to secure the expected benefits, it would not be essential for the uniform schedule to be adopted immediately by all states; (2) that, wherever adopted, the use of such a schedule would assist in keeping inspection departments up to the mark and would throw light upon the causes of accidents; (3) that, though the statistics obtained would have to be considered as understating the facts, they would very quickly be of great assistance in solving the problems of insurance in connection with workmen's compensation; and (4) that, in advocating a uniform reporting schedule, the Association for Labor Legislation is not relaxing its exertions to bring about the enactment of laws designed to secure directly the prevention of accidents.

In discussing the details of the schedule it was especially emphasized that as few questions as possible should be asked, for, it was argued, the employer will not answer a large number of questions, and, therefore, if the topics covered are too many, the information urgently needed can not be secured. In this connection the need for the third part of the schedule was one of the principal

points discussed. By some it was thought superfluous, cumbersome, and not likely to be sent in by employers, while others argued for its retention on the ground that some such arrangement is necessary to secure reports as to the final results of accidents and that, even if not always returned, it would minimize the necessary follow-up work and would at the same time notify employers of the character of information which they might at any time be called upon to give. During the debate upon this subject it was stated by Mr. Belnap, representative of the Interstate Commerce Commission, that, in the accident statistics furnished by the railroads to and published by that commission, the figures for employees killed represent only cases of death within twenty-four hours after the accident. If a man lives more than twenty-four hours he is officially classified merely as "seriously injured."

Other suggestions were that, in Part I, "1.f. Day of week" be omitted as unnecessary, that "1.g. Hour of day" and also "2.j. Hour at which injured person began work on day of accident" be omitted for the sake of simplicity, and that, "2.c. Had injured person been instructed as to danger of his work?" and "2.d. What guard, safety appliance, or regulation against the danger indicated by this accident was in use when accident occurred?" though educational, were not likely to be so answered as to produce information of any value. The employer, it was pointed out, would always report that the injured person had been properly instructed in regard to the danger, and that, if guards were not in use, they had been temporarily removed by the injured person without the knowledge or consent of the foreman or superintendent. It was also brought out in the discussion that sometimes an injured person may return to work at the same wages as before, and may therefore appear in the employer's report to have suffered no permanent disability, but that later, when sympathy with his misfortune has become less keen, he may be discharged or have his wages reduced because of some infirmity caused by the accident, and that such cases can usually be properly recorded only by a personal investigation following up the accident schedule.

It was suggested by Professor Commons that the Interstate Commerce Commission be requested to use the uniform schedule for accident reports prepared by the Association; and by Mr. Dawson

that the Census Bureau be asked to coöperate by collecting and arranging in statistical form the returns from all the states which adopt a uniform blank, and to enforce the making of such returns. "In this way," said Mr. Dawson, "the work of compiling the statistics, not merely for a given state, but for all the states which require these returns, will be greatly facilitated; and the information will be conveniently accessible at a central point. The advantage of utilizing the skill and experience of the employes of the Bureau of the Census in collecting and arranging such data must also be at once obvious."

After a second round-table conference of experts upon this subject, held at two o'clock in the afternoon, the schedule was referred back to the committee for revision and the incorporation of additional suggestions. The final schedule agreed upon by the committee is herewith printed.

REPORT OF ACCIDENT TO EMPLOYEE.

Part I.

To be filled out and sent in within 48 hours of the accident.

a. Employer's name.....

Part III.

Part III is to be detached when Part II is sent in and used for report of any of the following events subsequent to sending in of Part II: (a) death; (b) development of any permanent injury; (c) return to work. Fill in names before detaching. If (a) or (b), or a second period of disability, should develop after part III is sent in, the employer must send in a statement thereof.

Name of employer.....

Name of injured person.....

a. Death resulted on (give date)..... Give physician's statement of cause of death.....

b. EXTENT
OF
INJURY

Permanent injury resulted as follows (see instructions on back of this Part)

c. AMOUNT
OF
DISABILITY

a. The injured person returned to work for the first time after the accident on (give date).....
at the occupation of.....
and at daily wages of \$.....

Date of report.....

Made out by.....

(General directions or copy of law to be printed here.)

III

THE UNEMPLOYMENT PROBLEM IN AMERICA

FRIDAY AFTERNOON SESSION, DECEMBER 29, 1911.

Presiding Officer: CHARLES NAGEL
Secretary, Department of Commerce and Labor.
WASHINGTON, D. C.

INTRODUCTORY ADDRESS

CHARLES NAGEL

Secretary, Department of Commerce and Labor.

You have been advised, as I have been, that your plans for this afternoon have been somewhat modified. In other words, your time for listening to addresses is limited, and for that reason I shall not consume any of the time which ought to belong to those who have carefully considered the question to which we propose to address ourselves. Apart from that, I have assumed that I was selected as presiding officer because I happen to be Secretary of Commerce and Labor, and because my department is necessarily deeply interested in the questions to be discussed.

I see that the subjects announced are: "Unemployment as a Coming Issue," "The Experience of The National Employment Exchange," and "Recent Advances in the Struggle against Unemployment." It goes without saying that the problem not only is with us now, but has always been with all civilized peoples, and will be with us as long as civilization lasts. The fact is that there are a number of forces to accentuate the conditions of which we are to speak. On the one hand, I think it is safe to say that general sympathy with our fellow-man is stronger than it used to be. There is growth of the idea that all real happiness is predicated upon the success and welfare of our fellow-man. More than that, it is not purely and simply sentiment; we have come to realize that beyond sympathy a question of essential conservation is involved. At the same time, we cannot close our eyes to the fact that the forces at work in civilized countries serve to drive apart different classes of the community. They serve to enrich on the one hand, and to create on the other hand the very conditions which we would relieve. That presents the problem in its full sincerity.

The fact is that some of the manifestations of charity really, in the same breath, demonstrate the conditions with which we have to contend. The very fact that enormous gifts can be given, points out to us that some one must contribute a disproportionate part to make it possible to make those gifts. I never see a large charity recorded without saying to myself that I wish the donor might set his charity

back a few pegs, and have it go more for merit in the first instance and less for charity in the last.

You know, and I know, that every civilized country is struggling with this problem. We know that in England, in Germany, and in France they are contending with it; and by this time we know enough about our own country to know that there is no escape from the problems which confront those peoples. The question is one of wisdom. It is not a question of power, or authority, or will; it is a question of what is wise to do. That there must be regulation in many respects heretofore unknown in this country, we admit by this time. The old idea of individualism no longer obtains. The *laissez faire* doctrine has been abandoned. We know that there are conditions inevitably fastened upon us with which the government must deal. It is a question of degree; how far can the government with safety go? We know that we may regulate so far as to destroy competition, and yet most of us believe still that competition is a wholesome protection. We know that we may protect the wage-earner to an extent that may ultimately injure him. So here we may find in our investigations that there is such a thing as protecting the unemployed to such an extent that we may create the conditions against which we propose to safeguard. That is the question; every country is dealing with it; we have to deal with it. We have this advantage; we have a dual system. It is not necessary for us to take up the entire problem throughout the country at once. The national government may do much; it may institute inquiries; it may make reports; it may distribute information for all who desire to have it; but it is powerless by its own measures to afford relief for the entire country. We have forty-eight states, each and every one an experiment station; each and every one in a position to adopt this theory or that, as it may address itself to the discretion of the legislator. Each and all may move forward and learn in the light of experience of each and every one. With that opportunity in our hands, with the wisdom which we may gather from the experience of other countries, and with the earnest and constant investigations which our own states are making, I trust we shall be able to find some wholesome solution for this problem.

UNEMPLOYMENT AS A COMING ISSUE

WILLIAM HARD

Member Editorial Staff, Everybody's Magazine, New York.

I speak only as a man whose occupation obliges him to be aware of states of public opinion and of growths and changes in those states. I shall not attempt to convey to you, who are much more conversant than I am with the technique of industrial problems, any facts now unknown to you about unemployment. My purpose is very different. It is to indicate (1) that the problem of unemployment is rapidly gaining genuine recognition in this country, and (2) that the information which the public will need in legislating about unemployment is far from having been rendered available to it by those organizations, such as the American Association for Labor Legislation, to which the public has a right to look for technical guidance in such matters.

In the years 1900 to 1904 there were eight articles on unemployment printed in important American magazines. In the years 1905 to 1909 there were sixty-four articles on unemployment printed in important American magazines, and forty of these articles discussed conditions not in Europe but in America itself. The years 1910 and 1911 showed a proportionate increase in the volume of magazine attention given to this subject. It has emerged from its original concealment in such magazines as *Municipal Affairs* and the *American Journal of Sociology* into open appearance in the weeklies and monthlies of large general circulation. In fact, one might conclude that unemployment was on the verge, not merely of consideration, but of settlement, when one observes it in the pages of magazines which, although they have no objection to controversial questions, confine themselves usually in their choice of such questions to "The Propriety of the Occupation of Egypt by Napoleon," or "The Gratifying Advance Made by Democratic Sentiment in the Court of Frederick the Great," or "The Menace of the Monopolies Established by Queen Elizabeth."

Even more important than the increase in the volume of interest in unemployment is the shift in the direction of the attitude

taken toward it. No longer does the writer on unemployment in an American magazine write only about the vagrant, the tramp, the hobo, the down-and-outer, the man who does not want to work. Unemployment begins to be considered, even in the most popular of magazines, as a characteristic of that sponge which we call industry—a sponge which contracts and expands by terms of years, cyclically; by terms of months, seasonally; by terms of weeks or even days or hours, casually; according to its sudden need or lack of need, expanding and sucking labor in, contracting and forcing labor out,—a process in which control lies rather with the sponge than with the water.

This conception, old to the student, is new to the public. It begins, however, to make its way not only into the magazines but at the same time into the newspapers. There has just appeared, for instance, in the *Albany Argus*, an editorial, typical of many current editorials, which ten years ago would have sounded odd but which now sounds normal.

"It is to be expected that the number of persons employed in certain industries will be smaller at some seasons of the year than at others, but it is most unfortunate that there is a falling off in the total number employed in all industries in this country in the month of January of about a million. What are called seasonal industries do not confine their operations to any one part of the year. Some of them shut down in the winter and some of them in the summer, but the fact remains, according to a statement just issued by the Census Bureau, that January is the worst month for those who are dependent on their work for their daily bread.

"There ought to be some way of remedying this. A million workers idle in the middle of winter, when a family is necessarily under greater expense than in the summer, is a deplorable situation. There are many industries that could well increase the number of their employes in January, even if they had to reduce their forces somewhat in the summer in consequence. Manufacturers should get together and discuss this problem, with a view to providing employment for many hands in the season of the year when enforced idleness brings misery to many worthy families. Not only is there coal to buy in the winter, but more nutritious food is needed, and where there are children in the family there is apt to be more sickness than in the summer and more doctors' bills to meet."

When the public begins to think about unemployment in this way, the day of action is not far off.

So thorough has been the recent change in public opinion about unemployment that it has gone far toward destroying one of the most distinctive features of American literature. The funny-paper jokes about Weary Willy and Ragged Rufus have passed their meridian and now for some time have been declining into twilight and oblivion. Unemployment has ceased in America to be a joke.

To what element in society shall the public look for knowledge and for counsel in its treatment of a problem the seriousness of which it now recognizes?

It does not seem likely that Capital, of its own motion, will step forward and offer a solution. Indeed, it sometimes seems that Capital gazes, not merely with complacency but even with active satisfaction, on the growth in this country of the "reserve army of labor." In a recent issue of the *Wall Street Journal* the editor of that paper looks forward to the increase of our "labor reserve" as an inevitable and desirable restriction on the American cost of production. This editorial is noteworthy, both because of its intelligent anticipation of the growth of unemployment in America and because of its ingenuous—or else incredibly hard-hearted—acceptance of the human miseries along with the financial benefits of that prospect.

"More surprise than the occasion calls for has been exhibited at the large return of laborers to Europe shown in the official immigration and emigration figures for the past year. It is true that the outward movement has been sufficiently striking, but the phenomenon is not new. The kind of labor involved in the movement mobilizes easily, and can be demobilized just as quickly when employment becomes scarce. The laborers themselves are of a frugal class, and soon accumulate a reserve sufficient to pay their expenses to Italy or Hungary.

"In no other country is this the case. Australia has not begun to develop, and its trades union government discourages the kind of immigration which is so essential to our industries. For this reason also we pay higher wages, because we do not possess the European means of reducing them. Unemployment in England means poor-law relief, even with the habitually industrious classes, to say nothing of the large residuum of 'unemployables'. This automatically establishes competition in the labor market, and reduces wages at a

time when work is scarce and profits small, reducing the cost of living at the same time.

"But with us it is different. A large portion of our unskilled labor is alien and exotic. The native American is, in fact, only in the rarest instances content to make himself brother to the ox. Half a century ago the Irish emigrant was building our railroads or that part of them which required mere muscle. Such tasks have been successively carried on by other races, probably less efficient than the Irish, who rose rapidly in the second generation, replacing the native American foremen in the gangs in which they used to labor.

"Such a mobility of labor means a serious handicap in production. Wages do not fall here with anything like the rapidity of European states, while they retain their advances. To do this employment must increase or the supply of labor must be reduced. The latter happens in dull times like these, and it is curious that in all the fallacies which have been advanced to bolster our system of high protection this real argument for protection has never been fully appreciated. Here our manufacturers certainly need a compensating advantage; and it is difficult to see how it could be given except by the imposition of duties upon products not enjoying special natural advantages.

"We may make up our minds, however, that the outward movement of labor is merely temporary. All these workmen will come back when they are needed. They take a heavy ransom from the country without spending much in it. But we are young, and largely undeveloped, and must bid high for the help. As conditions become more settled and population grows up this disadvantage will tend to diminish, and we shall breed, by the children of the workmen who finally make their homes here, a reserve of such labor of our own as will automatically restrict emigration and immigration, exactly as it does in Great Britain or Belgium."

The financial view of unemployment to-day is that it regulates population and wages. This view of the case does not recognize the theory that those who are responsible for the industrial government of the lives of the people are likewise bound to keep the people industrially occupied, that those who control the means of life are bound to give the people access to those means.

With the Bridge and Structural Iron Workers Union the irregularity of daily employment makes it necessary for members to travel

from one part of this country to another so numerous and so constantly that if you look at the records of any one of their local organizations, such as the New York District Council, you will find that every month an extraordinarily large proportion of the membership, varying from six to ten per cent, takes out traveling cards and starts on journeys which often include, before the circle of the search for employment is concluded, the farthest sections of the West and of the South.

The constantly nomadic character of this life breeds a race of men who are homeless wanderers, unrestrained by any of those homely ties which bind men to habits of personal regularity and lawfulness. Labor has lately been doing some confessing. When the full failure of our industrial government on this one point of regularity of employment has been fully understood, we shall see Capital in the dock too, doing some confessing of its own.

If in the meantime we need not expect any immediate action about unemployment from Capital as Capital, neither need we expect any immediate action from Labor as Labor. Of course, unemployment falls upon the unionized as well as upon the non-unionized and, in strikes, when the unemployed come in to replace the unionized strikers, it is the member of organized labor who sees with especial vividness the consequences of the maintenance of the "labor reserve." When the garbage-wagon drivers of New York went on strike last fall, the city had little difficulty in bringing almost instantly four or five thousand irregulars to discharge the duties abandoned by fifteen hundred regulars. These irregulars, according to the testimony of newspaper reporters who observed them, were not, in the main, professional adventurers, but were normal—and otherwise self-respecting—workingmen who needed shoes for themselves and food for their children.

Nevertheless, though suffering from unemployment both directly and indirectly, the trade unions seem unlikely at the present time to gather the facts and to advance the policies with which unemployment must be attacked. Mr. Gompers, in his official organ, the *American Federationist*, is able to see in the idea of labor exchanges nothing but the possibility of their being used as means by which to conduct the immigrant into the job of the native-born. When he has indicated that possibility he ceases from his discussion of unemployment, and apparently, so far as he is concerned, the re-

serve army of labor may continue to frustrate many of the efforts of the very forces which Mr. Gompers is leading.

It seems clear to me, in the circumstances, that the attempt to formulate an unemployment policy will arise, not directly from among the combatants in the Labor-Capital struggle, but, just as in the case of our recent industrial accident policy, from a union of all interested people, whether employers or employees, who, meeting on the basis of their interest in this particular topic, determine to present to the legislatures of our states the information which they need in order to act wisely.

Public opinion about unemployment has to-day reached a point which was reached a decade ago by public opinion about industrial accidents. Just as we began to have industrial accident commissions then, we shall soon begin to have a series of commissions to consider unemployment and its remedies. But the early industrial accident commissions adjourned with no results reached. The facts about industrial accidents had not been collected, classified, presented.

You know what a commission is. It is what it ought to be. It consists of very intelligent and thoroughly uninformed men, who together form a strong and efficient mental vacuum in which the experiment can be made whether or not the information about any given topic is yet of sufficient density to raise the wings of legislation.

The commissions which meet to consider the subject of unemployment ought to find on their tables, as soon as they meet, a complete work, in as many volumes as is necessary, giving them a map of the problem of unemployment in modern industry. What happens otherwise? Witnesses are subpoenaed; they appear; they talk at length and at random. The commission is bewildered. It tells its secretary to go out and get the facts. The secretary does his best. If, as in the case of the New York commission on unemployment, the secretary happens to be Mr. Leiserson, he finds a great many facts and goes back with them admirably arranged in their relation to one another. But, at the most, he does the work of one man, and of one man only.

What I want to suggest is that through this Association there should be produced, in the course of the next few years, a composite report from many sources, representing the observations of many individuals, covering all sections of the country, presenting all the

many phases of unemployment in their sequence, and providing the prospective legislator with an organized body of information, part of which does not exist at all to-day, and the rest of which, since it is very widely scattered through the pages of many books and through the memories of many individuals, exists only as an abstraction.

A report of the sort I have in mind would follow the problem of unemployment through its manifestations at all points of the industrial field.

It would present the facts with regard to the cyclical fluctuations of industry and would convey to the reader the plans already suggested (by the Webbs, for instance) for making public work larger in the years when private work is smaller.

It would give the facts with regard to the seasonal fluctuations of industry and would consider, as being perhaps particularly applicable to such cases, the unemployment insurance devices developed in Europe.

It would give the facts with regard to typical instances of casual employment and would describe the labor exchanges of England and of the Continent.

It would go on from discussing the fluctuations of industry to giving the facts with regard to the existence, at all times, of the "labor reserve," and would present the claims made by certain socialistic reformers with regard to the advisability of the establishment of public works expressly for the employment of that reserve.

It would go on to give the facts about the men who no longer wish to work, the men who can be regarded as deserters from industry. It would give the facts with regard to what efforts have been made by farm colonies to restore such men to the ranks.

It would go on to give an account of those who are unemployed partly or wholly because of being unequipped, who have never had industrial preparation, who have gone into blind-alley occupations, who pass from one job to another with increasing discouragement until at last they fall among the deserters.

These last two phases of unemployment, the situation of the man who is unemployable because of the absence of the will to work and the situation of the man who is unemployable because of his lack of industrial competency, would have to be considered mainly from the standpoint of the individual, to complement the three previously

mentioned phases of unemployment which would have to be considered mainly from the standpoint of industry itself.

A report of the sort I have in mind would not fail to consider immigration and would give to the opinions of Mr. Gompers and his associates a full analysis and a complete presentation.

Nor would a discussion of unemployment be complete unless it considered, so far as is possible, the loss caused to the country by its failure to utilize its labor-power continuously and the further loss caused to it by having to support, through public and private charity, those who are either willingly or unwillingly idle.

We might just as well make up our minds now that the commissions on unemployment will have to develop a composite unemployment policy. This subject cannot be treated by one act enacting one remedy. It stretches all the way from industrial courses in our public schools to the compulsory interstate registration of all traveling workers, from the treatment of vagrants to the subsidizing of trade unions which give out-of-work benefits, from the organization of local labor markets to the intelligent distribution of public construction over long periods of years.

A statement of the problem of unemployment which would enable a commission to outline an unemployment policy would have to be very large and very complex. It would have to consist of contributions made by many individuals, each of whom had brought together the facts with regard to one phase of the matter; and these contributions would then have to be arranged in proper order, and analyzed, and summarized.

The production of such a statement of the problem of unemployment would mean that individuals in all parts of this country would have to be brought into a coöperative plan. It would mean that the work which they contributed would have to be assembled and published by a central body.

That body should be this Association.

THE EXPERIENCE OF THE NATIONAL EMPLOYMENT EXCHANGE

EDWARD W. CARPENTER

Manager, National Employment Exchange, New York City.

The unemployment problem, to be treated properly, must be divided according to classes. Existing conditions pertaining to some occupations may not be the same with respect to others. I shall speak only of the various classes which have come directly under my observation as manager of the National Employment Exchange since its opening in May, 1909, taking up first the class of office help—men and women.

There is a great over-supply of people in New York City seeking office work. A goodly portion of this over-supply is caused by this class coming to New York City from other parts of the United States with a view to bettering themselves, but lured on also by the attractions of the city. This surplus is the main cause of the extremely low salaries paid to most of the clerks—salaries so low that it is inconceivable how they get along.

A large number of those seeking clerical work are not fitted for it, with the result that if they do secure a position they are unable to hold it, and would have been much better off had they learned a trade. This is especially true of the boy who does not remain at school long enough to get sufficient education to fit him for clerical work. What is the result? He is obliged to enter occupations in which his chances for advancement are poor. Children should be given a more practical education or manual training along lines that would be of direct benefit to them in earning a good living. There are thousands of widowed mothers working day and night to support their children until the law permits them to leave school, and looking forward to the time when the older ones can help to support the family with the little three or four dollars they are able to earn per week. What a relief these children would soon be had they been taught a trade, thereby enabling them to earn fair wages! If every state would pass a law making manual training compul-

sory in the public schools, much of the handicap that now exists could, no doubt, be avoided.

With reference to manual labor, one of the reasons for some men being out of work for longer periods than industrial conditions warrant is the lack of a proper medium for bringing employers and employes together. A central place of information is needed,—such as they have in Berlin and London. The National Employment Exchange has been trying to establish such a place, but it takes time and we have a great deal of competition. For the year ending September 30th, 1911, we recorded requests for 3890 men at our manual labor branch. We were obliged to decline a number of orders during the summer months, knowing we could not fill them, and some were declined on account of the small wages offered. We placed during the year 2398 men and gave many more an opportunity to obtain work, but they either did not accept the work or the employers did not accept them.

New York is full of naturally idle, irresponsible men, who will not work unless driven to it, and then only for a very short time, either leaving voluntarily, or being discharged for incompetency or worthlessness. Such men are a detriment to the honest workingman. They will often ship out with a gang for work in another state with no intention of going to work, merely to see the country. The result is that employers are loath to advance railroad fares. It is safe to say that there are employers throughout the country who are in need of help today, but who do not want to take the chance of advancing fares and not securing men who are sincere in wanting work. We find it is not an easy matter to secure men for given trades, which would indicate that those who have trades keep employed when there is work for them. Nor are good, reliable men always available for porter work, or for any other occupation for which no particular skill is required. The demand for farm hands exceeds by far the supply during the season. We have never been able to meet the demand made upon us for common laborers during the summer months. Still the parks are filled with the unemployable—a class consisting of men unfit for work and of those who will not work. We have on several occasions sent representatives through the parks explaining to the men there what we had to offer, but we have never met with much success in inducing them to go to work.

Each year we read of the hundreds of foreigners returning to

their native countries with their savings of five hundred to a thousand dollars to buy farm land. The park loafers have the same opportunity to save money. If there were more men given to farm lives here, it would help to lessen the number of unemployed and to increase wages.

Although the unemployment problem may never be solved, I believe present conditions could be improved upon. There will always be some who will lead lives of idleness in spite of all that can be done, but the number may be reduced. When a man gets a taste of a life of idleness, and finds that he can exist on what he obtains by begging, or receives at the hands of charity, or earns by working a day or two now and then, it is hard to break him of that habit. His state of mind soon becomes torpid; he loses all ambition and cares little what he does or what becomes of him. Feeding him and giving him a place to sleep occasionally are not what he needs; nor are you going to break him of the habit by sending him to prison, where he will be stamped as a criminal and blacklisted, where he will be with crooks and have his mind further poisoned with their experiences. What is needed is a preventive, a strictly enforced vagrancy law in each state,—to keep him, if possible, from becoming a vagrant. We are all creatures of habit; do not let him get out of the habit of working. As has already been suggested, provide a large farm where a man can be sent,—whether he is unable to find work, or is unwilling to work,—a place he can leave when he is ready to accept work, and that will not reflect on him and be a detriment to his chances of securing employment. This farm should not be made attractive to the men so that they would not care to leave it. They should be made to work longer hours than men in commercial enterprises, so that they will prefer to work outside of the farm. The expense of conducting such a place could be partially offset by supplying the various state institutions, such as hospitals, prisons, and asylums, with provisions produced on it. Many of the men, after learning farm work, could obtain employment with farmers, who are constantly in need of help during the season, and who have acres of untilled land because of the lack of sufficient help. On this farm a factory could also be maintained where some of the articles used in the public institutions could be made. These factories would provide work for many men during the winter months.

The unemployment problem is becoming more serious each year; the steady increase of population alone adds to it. Any action taken now may not be of great benefit at the present time, but will, no doubt, be of benefit in the future. The problem is fast becoming a great issue in this country, and, if action is not taken soon by passing a law to better the situation, it will be a grave problem to handle in later years. As the number of vagrants increases each year, they will find it harder to live, and more will resort to begging, stealing, and robbery. We have many criminals now and, if vagrancy is permitted to continue, we will have more.

In conclusion, it seems to me the great need to-day is to impress on the minds of the state legislators the importance of the unemployment question and to urge them to some action. Few legislators have had the necessary experience to enable them to draw up a feasible plan to better the situation, and therefore, because of the lack of a definite plan, it is not likely they will voluntarily take any action. If a committee were appointed, composed of people familiar with the problem in its various phases, which would draw up such a plan and present it to the legislatures of the states, the chances for action would be much better.

RECENT ADVANCES IN THE STRUGGLE AGAINST UNEMPLOYMENT¹

CHARLES R. HENDERSON

Professor of Sociology, University of Chicago.

THE MEASUREMENT OF PROGRESS

Progress in the struggle against unemployment must be tested and measured in three directions: statistics, preventive measures, and insurance.

I. *Statistics:* We have need of more adequate and uniform statistics of the facts of unemployment, (1) to correct our national beliefs about the evils and dangers of unemployment—to arouse the nation, and even wage-earners themselves, to the evils and miseries of unemployment; (2) to map, locate and measure the phenomena according to seasons, cycles, trades, and localities; (3) to present the uniform conditions under which wage-earning is suspended, so as to isolate the causes and measure their relative importance; (4) ultimately to give us the relative risks in the several trades, with averages of very large numbers, through considerable time, and over wide areas, as the basis for actuarial calculations of the cost of insurance.

But we cannot wait for complete statistics before we introduce ameliorative methods. It is in connection with the employment bureaus and insurance funds that the most useful statistics will be furnished. Workingmen, philanthropists and public officials are not interested in keeping records and making costly returns simply to bury figures in a dusty library; they must be able to see the value of their tables in relation to their tasks, or to some immediately useful social end.

II. *Preventive Measures:* (1) The point of starting ameliorative effort is the employment agency or "labor exchange". The function of the employment bureau is to bring together those who offer a supply of labor and those whose idle capital seeks human

¹ This is merely an outline of Professor Henderson's interesting and valuable speech upon this subject.

agents of production. Much unemployment is due to ignorance, to the absence or maladministration of employment agencies.

The most effective of these agencies are: (a) the trade unions, which are in the first rank where they are well organized; (b) the state employment offices; (c) a large number of private agencies, run for profit, many of them unscrupulous and all in great need of public control; (d) charitable offices, which are usually of little importance except for the rejects of the industrial world.

When we compare the ordinary employment office with a board of trade for cotton or grain, or with a bankers' clearing-house, we begin to realize how belated, rudimentary and primitive our present labor exchange is. Yet the issues at stake are quite as vital in the case of demand and supply in the labor market as in the stock and grain trade.

(2) A second preventive measure is the organization of combinations of managers of business to utilize idle labor in dull seasons. Such dovetailing of work is already common. Thus, for example, many seamen on the great inland lakes, during the intervals of navigation, seek work in lumber camps. Men whose winter work is suspended are hired to cut ice on northern lakelets. Harvest hands travel from Texas northward to Canada as the grain ripens, and so have continuous work at relatively high wages. It has been suggested that indoor winter industries might be developed for masons and others who cannot continue operations through our cold winters. Periods of even enforced idleness are demoralizing and unwholesome; if they cannot be prevented altogether, they may be reduced in extent. Public and quasi-public bodies, moreover, might spread some of their contracts over ten-year periods and thus diminish the violent alternations of the labor market.

(3) Relief works, (a) whether run by employers, or (b) by public bodies, have generally been disappointing. It is impossible to find profitable work for a heterogeneous crowd of workmen from many trades and from no trade. The cost of supervision is high, the destruction of tools and materials relatively great, and the product of low grade. Economically it would seem to be cheaper to support the indigent in idleness than to employ them in this way; and morally it is not certain that men are improved by pretending to be useful, when everyone knows they are only marking time.

These objections, however, do not apply to a systematic distri-

bution of the demand of cities and governments over long periods, with a view to equalizing employment.

(4) Another element which is certain to secure more adequate attention in the future is the organization of educational systems for vocational training and for guidance in the selection of trades. A vast amount of unemployment is caused by misfits. Our schools have, until recently, never established vital connections with the shop and the farm. Boys and girls are left to drift and become social derelicts. There is no good reason why society should register all children of "school age" and require their attendance at school, only to abandon them to ignorance, passion, and accident just when they are passing the dangerous rapids of adolescence. Continuation and half-time schools, with a complete system of supervision and direction as to callings, would spare multitudes the misery of unemployment and society the burden of supporting parasitic wastrels and criminals.

(5) Mr. Sidney Webb proposes that the "unemployable" be sent to training houses or colonies,—those who are willing to learn to voluntary groups, with support while they are being taught, and those who are vagabonds or inebriates to compulsory establishments. The "unemployable" cases in the labor market are often the "unhelpable" cases of charity organizations. It is impossible to give them any real and permanent relief by ordinary doles, whether of food or advice. They serve only to bid low against competent and self-supporting men who are trying to maintain or raise their standard of living; and they can do this just because they are irresponsible and partly parasitic.

III. *Insurance*: In America we have made a beginning in providing income for dead periods only in a few of the trade unions and by individual savings. It is in these two directions we must look for the lines of development in the near future. With the thriftless habits of multitudes of American workingmen and the miserable and irregular wages of thousands of others, we cannot, however, place much reliance on individual savings. Education and practice in social coöperation not only produce higher civic virtue and larger intelligence, but offer a more secure and solid basis than individual savings and such investments as are within the reach of men inexperienced in business. It is, therefore, to the trade unions that we must first look for the most promising development in the direction

of insurance against unemployment; later we may hope for legislation.

THE INTERNATIONAL ASSOCIATION FOR THE STRUGGLE AGAINST UNEMPLOYMENT

At this hour the most effective agency for gathering information and promoting effort is the International Association for the Struggle Against Unemployment (Secretary-General, M. Louis Varlez; Ghent; Editor-in-Chief, M. Max Lazard, Paris, France). This Association has been established by private means and publishes a quarterly bulletin. It now makes its appeal for government subsidies on the ground that it can furnish to legislators and public officials information which is essential in preventing the evils of unemployment. The subsidies received from any country are devoted 70 per cent to the national section and 30 per cent to the international committee. The bulletin publishes documents and essays relating to the experiments made in all countries, statistics of unemployment and of remedial agencies, critical reviews of books and articles, and texts of laws and regulations. Already Belgian cities and Paris have made contributions. The proceedings of the association and the bulletin furnish details which help us to understand and estimate the value of the attempts of German, French, Swiss, and Belgian cities, and of the radical measures of the British government.

THE BRITISH INSURANCE ACT

We may well close our study with mention of the most recent and most advanced national movement, the British insurance act. For more than a century the legislature of Great Britain guarded sacredly the titles to inherited estates, protected property, and worshipped with sincere devotion at the shrine of individualism and *laissez-faire*, but left its working people to chance for education, for health, for employment, and for income in times of stress. Nothing but immense inherited vitality could have carried the nation over this age-long neglect, and millions became degenerate or died. Beginning with the struggle over the factory acts, however, the social conscience of our mother country was awakened; elementary schools were established; and the sacred rights of property were weighed along with those of childhood, of youth, and of motherhood.

Meantime Germany forged to the front as a competing nation in manufactures, transportation and trade. The new empire, after the

failure of a policy of repression of workingmen's efforts, launched upon its magnificent and successful system of obligatory insurance,—sickness, accident, invalidity, old-age, and family insurance,—and, along with insurance, developed a system of prevention of accidents and diseases which improved the physical energy and industrial efficiency of millions of workers.

The rise of this mighty competitor alarmed England and compelled her to consider the sources of this unexpected development of energy. In the compensation act of 1907, faulty as it was, England began, in her own way, to develop a system of workingmen's insurance. The old-age pension bill followed, and it recognized, even more distinctly than did the German law, the obligation and interest of the nation in its worn-out workmen. The recent sickness and unemployment insurance act completes the cycle and ventures on the field of unemployment with a boldness which surpasses the most adventurous attempts of all the continental governments. While Germany, France, and the others are still gathering statistics, Great Britain has enacted a law which sets the statesmen of the world a more rapid pace, and calls them to gird themselves anew for the march of humanity forward.

NEED FOR AN AMERICAN SECTION ON UNEMPLOYMENT

With a sort of blind optimism and smug comfort which is not justified by facts, our legislators fail to realize the suffering caused by unemployment in our own cities. The anxiety and terror of vast numbers of families have not yet touched our nation. To bring the facts home to the national conscience we need adequate statistics and, at the same time, an effort to extend and perfect such measures as are even now practicable.

To formulate a policy and urge it upon our countrymen is a proper and worthy task for the American Association for Labor Legislation. This Association, however, is not in a position to assume new financial obligations and burdens. It would be wise at present only to organize an American section on unemployment, auxiliary to our Association for Labor Legislation, and to permit it to solicit members for the International Association. Possibly such a section could secure the coöperation of the federal Department of Commerce and Labor, of state bureaus of labor and employment offices, of cities, and of quasi-public corporations.

Unless we take up the entire system as our own our forces will be

divided; other organizations will be formed, will compete with us for money and interest, and will clash with our proposals simply from want of understanding. The business world has already gone in advance of us, when university men ought to have led. They are busy with their various and conflicting schemes of insurance, while we have gone no further in principle than England reached before 1897. I appreciate the financial difficulties, and do not see where we can get money for a more vigorous policy. But we can at least challenge the possessors of money by doing our best with such means as we can command; and we can make a beginning.

Protection and prevention must form an essential part of any scheme of labor legislation, and it must go first. In this we have made no mistake. But the protective devices cannot be worked with best effect apart from a general and comprehensive social policy, which includes insurance against loss of income in consequence of sickness, accidents, invalidism, old age, family crises of birth and death, and unemployment.

I therefore beg leave to offer the following resolutions:¹

Resolved, 1. That the president of the American Association for Labor Legislation be authorized to appoint a committee of five persons to represent this Association in its relations and correspondence with the International Association on Unemployment, and to name the chairman;

2. That this committee shall have power, in the name of this Association and through its central office, to diffuse information about the International Association on Unemployment, to secure members for it, and to nominate the delegates to the International Association on Unemployment; it shall be the duty of this committee to make a report of its activities each year to the American Association for Labor Legislation;

3. That when ten members have subscribed they shall constitute the National Section for the United States, and have authority to adopt regulations, subject to the approval of the Executive Committee of the American Association for Labor Legislation;

4. That the subscription shall be fixed at 10 francs (\$2) for each individual member, payable to the secretary of the American Association for Labor Legislation, it being understood that each person who pays this sum shall be entitled to a copy of the publications of the International Association on Unemployment.

¹ These resolutions were passed and the committee was appointed. See pp. 159-160.

GENERAL DISCUSSION

TERENCE V. POWDERLY, *Chief of the Division of Information of the Department of Commerce and Labor, Washington, D. C.*: Limited to five minutes, I am to discuss a subject that has claimed the attention of mankind for centuries. It is a hopeful sign that so many minds are now thinking out a solution of the problem of unemployment. Did I understand you to say (addressing Mr. Hard) that the first magazine article on this subject appeared about five years ago?

MR. HARD: In 1904, I believe.

MR. POWDERLY: It was longer ago than that. The *North American Review* opened its columns to me in 1882. I think you'll find it in the August number of that year.

Many causes of unemployment are advanced. Some lay the blame at the door of the trusts, others to excessive immigration, others to intemperance, and still others to many other influences. I shall not have time to discuss any of these claims; but my personal experience with men warrants me in saying that more intemperance is due to poverty than poverty to intemperance; and, as idleness is one of the by-products of intemperance, we should seek, as you are no doubt seeking, the cause or causes, for they are many, of unemployment.

I have heard it said that many are idle for want of opportunity to toil. That may be true, but I incline to the opinion that lack of knowledge of opportunity is a still greater cause of idleness. The division I represent could have directed two hundred thousand to places of employment if the unemployed had knowledge of the opportunities and means to pay for transportation. Five thousand men, many of them heads of families, were placed by the Division of Information last year, and they stay where they were sent, for each one is told to report any failure to secure employment or any unfair treatment. Only five have been reported as not arriving. Some of those we directed to places two or three years ago are writing in to say they are buying farms, and ask that workmen be sent to them.

We have now enlisted the coöperation of state boards and bureaus of immigration and state employment agencies, and are establishing a system of coöperation between the various states and the federal

government, through its Division of Information, that will eventually make it possible for every unemployed man to know, not only just where there is a vacancy which he can fill, but everything in connection with it.

During the fiscal year 1910, 202,000 aliens who had worked in this country went back to Europe taking with them their earnings which, it is estimated, averaged \$600 each. If this is correct, they took with them one hundred and twenty millions of dollars. Their purpose was to buy land in their old homes. A good authority asserts that they will have to pay from \$250 to \$400 an acre for worn-out land abroad. Good land, close to the best of markets, may be had in this country at prices ranging from \$20 to \$100 an acre, but these aliens knew nothing about it. All this will change some day, but the way in which it can be done cannot be told in five minutes—the time is too short.

DARWIN J. MESEROLE, *Attorney, Brooklyn, New York*: At the outset of the discussion of the problem of unemployment it still seems necessary, if we judge by the utterances of public men of high official position, to prove that there *is* such a problem,—*i. e.*, that there are in this country, at all times, hundreds of thousands of able-bodied men, of various degrees of efficiency, who are unemployed because of inability to secure work, and that in times of great industrial crises or panics it can be easily estimated that three or four million men are out of work for months at a time. In the spring of 1908, four or five months after the acute phase of the panic of October, 1907, it was estimated by charitable and philanthropic organizations that, on April 1st, there were 200,000 men out of work in New York City alone. These figures were later confirmed by Mayor McClellan through an independent investigation. Under ordinary conditions the number of unemployed men in New York City probably does not exceed 60,000, but it is rarely if ever less than that number.

At that time meetings of representative citizens of New York passed resolutions urging the state and federal authorities to take action in this matter,—not to take radical action, but simply to appoint commissions to ascertain the number and condition of the unemployed throughout the country and to devise means of immediate relief and permanent remedy. The President and Congress

did nothing; and now after four years a New York State commission, appointed partly to investigate and report on unemployment, has made its report to the legislature and has had introduced a bill providing for free employment agencies; and a farm colony bill has been passed in that state.

Constituted authorities, including our statesmen, the law-makers, systematically ignore this great problem until it reaches the last desperate phase of vagrancy or mendicancy. Then when the problem compels attention, the officials and the public press clamor for the "suppression" of the beggars or vagrants by arresting them and committing them to the county jail, workhouse or penitentiary for periods of from ten days to six months. This treatment of the great problem of unemployment is pretty general, not only throughout this country, but in most civilized countries. Men honestly seeking employment, charged with no crime, are arrested for vagrancy,—the "crime" of being out of work,—and are committed to prison to be there degraded by prison stripes, iron-barred cells, Bertillon measurements,—the treatment accorded the most vicious or confirmed criminal. Thousands of men are thus committed every month in this country, many of them at their own request in order to avoid starvation or the commission of crime. Many, in fact, commit some petty crime to insure a certain or a longer commitment.

What must be the fruit and result of such action on the part of the state? First, the making of criminals out of men who have been law-abiding members of society; and second, the endangering of the maintenance of law and order itself, for which government is supposed to exist. Furthermore, there can be no more expensive treatment of this great question than our method of arrest, court procedure and imprisonment,—generally in idleness for short periods, the same men often being arrested over and over again, each time becoming more hopeless and dependent, or hardened. Our present method of dealing with this question is, indeed, unjust, unscientific, and extremely expensive. We often wonder at the increase of crime and insanity. The marvel is, when the same treatment is accorded the criminal and the man honestly seeking work, that crime is not far more prevalent. It is only the inherent goodness, integrity or cowardice—whichever you like—of human nature that keeps the crime statistics so low in the face of so great provocation to crime.

Why is it that all civilized countries continue to spend millions of

money every year in "suppressing" the unemployed and making criminals of them, instead of acceding to their demand—or rather their piteous appeal—for work to enable them to support themselves? Are we afraid to acknowledge a man's right to live and to demand work to support himself and those dependent upon him? Are we fearful that sanctioning such an obvious right might disturb the existing structure of society? No clearer lesson is taught by all history than that those in power in a state, who seek to retain that power by continued acts of injustice and oppression, have always lost all by failing to heed the appeals, petitions, and later the warnings of the oppressed. With the increased productivity due to modern science and inventions, no man will say that this country cannot or does not produce sufficient for the comfort of all. Why, then, should an able-bodied man or woman be denied his or her share in that product if willing to labor for it.

Does some one say that it is too big a problem for government to solve and that the cost would be enormous? I ask how does the government finance the Panama Canal, or build \$10,000,000 warships to be thrown on the junk heap in a few years? Or how long would it take the government to employ, equip and support these unemployed men, and millions more if necessary, to repel an invasion, or for any other military purpose supported by public opinion? Surely, if in time of war or preparation for war, a government can, at enormous expense, equip and maintain great bodies of men in unproductive and often destructive activities, that same government in times of peace can, at far less expense or at a great profit, employ its citizens in productive industries.

To be specific: We have no such thing in this country as a system of highways,—roads over which farmers or automobilists can travel with safety or comfort. The roads of the United States, concededly the wealthiest country of the world, are a disgrace to any civilized nation, or to any uncivilized one. They could not well be worse than they are. Is it too much to ask—to demand—that this necessary public work be started at once and that the federal and state governments, sharing the cost in some equitable proportion, construct and maintain a system of highways that shall be a credit to our country, and at the same time save millions each year to our farmers and all others who use our roads? There are two crying needs in our country today: the employment of the unemployed,

and the building of good roads. Is it possible that we are not yet ready to do the perfectly obvious thing?

HENRY W. FARNAM, *President of the American Economic Association, New Haven, Connecticut*: I am glad to support Professor Henderson's motion. It so happens that I have just received a long communication from Monsieur Louis Varlez, the secretary of the International Association at Ghent. I was one of those who attended the meeting in Paris in September, 1910, at which this association was organized, and on that account have received a number of communications from the office during the past year. My position on the committee is, however, only a temporary one, and I think it very desirable that we should have some kind of an organization to represent the United States, and to keep us in touch with what is being done abroad. Unemployment is not, in my judgment, as serious a problem with us at the present time as it is in many parts of Europe, but it is not impossible that we may before long be confronted with this question, especially if a commercial crisis should throw a lot of people out of work. We ought to be prepared to meet such a crisis in case it should arise.

MILES M. DAWSON, *Counsellor-at-Law and Consulting Actuary, New York City*: I arise to second the resolutions which Professor Henderson has offered. It is, in my opinion, of the greatest possible importance that we connect ourselves with the movements in other countries which are making for the discovery of the causes of unemployment, and thereby for the prevention of the same, and for the relief of persons who, by reason of unemployment, are brought to destitution, involving also very frequently the impoverishment of families. Much has been done in other countries in this regard which we could study profitably, and the enormous progress which has been made in the past three years, including nation-wide compulsory insurance against unemployment in Great Britain, plainly indicates that there is a duty before the American people which we ought not in any way to shirk.

I find myself in absolute agreement with one other suggestion made by Professor Henderson, which might to good advantage, I am sure, be taken under consideration by the governing board of our Association,—*vis.*, that as regards these matters of unemployment

and all other matters of great importance which come before us, we can best proceed by ascertaining and defining clearly what constitutes the best thing, and declaring for it openly, while at the same time announcing the readiness of the Association to put forth all possible efforts to assist in accomplishing anything anywhere in the entire country which makes for the relief of recognized evils, for the establishment of correct principles in regard to their treatment, and generally for the betterment of labor conditions.

It does not seem to me that there is any inconsistency in these two attitudes. In any event I have not found such inconsistency in determining my own personal attitude toward this or that thing when proposed; and it does not seem to me that there ought to be or can be any real embarrassment in announcing our general advocacy of what is deemed the best thing to do, while at the same time expressing absolute willingness to coöperate to bring about anything short of the best, if that is all that can be secured under the circumstances and at the time. Thus, for instance, in this matter of unemployment, it is susceptible, I think, of absolute demonstration that of all the plans,—such as local and voluntary, local and subsidized, local and compulsory, national and voluntary, and national and compulsory, to mention only a few of them and these in the most general terms,—the only one which offers a full solution is the national compulsory plan, carried out, however, by such agencies as will fix the responsibility where service can best be given and will encourage prevention in the largest measure.

The study of the causes of unemployment, if thoroughly pursued, will contribute ultimately much more to the solution of great problems of statecraft than all the speculations of economists,—not to speak of the devising of platforms for political parties. This, attempted on anything less than a national scale, is futile and even foolish. Sufficient attention has been paid, and doubtless more attention will be paid to-day, to the insufficiency of the old explanation of unemployment in this country,—*viz.*, that any man can get a job who wants one, and that therefore he who is out of a job must be a man who does not want one. The enormous causes, though no doubt simple in their nature, are not obvious, but would become so inevitably if a good, nation-wide system of unemployment insurance were in force. Thus, for instance, in the year 1893, we had a most peculiar condition. Perhaps the fundamental proposition relating

to employment in occupations other than the production of food is that the number of persons who can be spared for such occupations and can be supported in them, is determined and limited by the surplus food produced by those who are engaged in its production. Yet that year, in the face of the production of an unusually large amount of surplus food, the condition was produced of almost absolute prostration of our industries, and the unemployment of a vast number of our people. This was attributed on the one side to the demonetization of silver and on the other to the attempted maintenance of bimetalism—one of these explanations being, in point of fact, just about as much clap-trap as the other. In any event, it is certain that if, by reason of a good national system of unemployment insurance, the stress came upon all workmen and all employers, we would be satisfied with nothing short of the truth; we would naturally then expect those in charge of unemployment insurance to discover and provide in advance against catastrophes of this sort, and incidentally to expose their causes, to the end that they might be avoided. The foregoing is a mere indication of the enormous possibilities of unemployment insurance, which could in no wise be realized except by grappling with the problem on a broad and national scale.

Yet there is nothing in such a conception of what should be done in this matter that in the least militates against either an association or an individual giving all possible support to plans for purely local relief,—such as labor exchanges, voluntary unemployment insurance, etc.,—or to the adoption of measures by municipalities or by states which would deal with this matter as efficiently and completely as conditions and circumstances might allow. It is advisable, it seems to me, that the Association take a definite and advanced stand, while at the same time expressing its willingness to cooperate to ameliorate conditions in any and every practicable way. The first step in this direction as regards unemployment will undoubtedly have been taken if we cooperate with the international organization; and, therefore, I most heartily second the resolutions offered by Professor Henderson.

GOV. TEATS, *Attorney, Tacoma, Washington*: It seems to me that nearly all that has been said to-day concerning the unemployed has been about how to provide ways and means to care for that

great class of men. You have talked charity, and it seems to me you have not tried to get at the reasons for, or a remedy to provide against the creation of the unemployed. I have been one of that great class in my early days. I know what it is to be out of work and only a few meals ahead. I know what it is to seek employment when hundreds are after the same job. After seeking in vain for work in Kansas City in 1884, at the time of the money panic—you who are old enough to remember—one day I saw men at work under a shed at the top of a hill near the street. My heart grew glad as I thought that perhaps there was a chance for employment for me. But as I commenced climbing the hill toward the men at work the noon whistles blew, and the men arose from their work and began walking off, carrying balls and chains,—and the clank of those chains told me they were criminals, merely working out their fines. I was at such a point of desperation that, had it not been for the thought of my wife and babe, I would have hurled a rock through the plate-glass window on the far side of the street to obtain employment even with the criminals. But I did not want charity. The great army of the unemployed do not want charity. They want employment at honest labor. They want an opportunity to work, and thus to earn their living.

The only remedy for unemployment is employment. Provide ways and means for men to receive work when labor-saving machines drive them from their jobs. When I was a boy my brother-in-law and I made a whole farm wagon. That is impossible to-day; a man makes only a small portion of the wagon; it requires many men to make the whole. The wagon-makers have been taken from the four corners, from the cities and towns, and have been placed in great factories where they are but cogs in the vast machine. When the invention of a labor-saving machine throws many men out of employment they must join the army of the unemployed; they cannot make a wagon and thus find their own employment; they have only made a spoke, or a dash-board, and perhaps only a part of that. Wagons are no cheaper, but the men employed to make them do only about forty per cent as much as in the old times; the rest is done by machinery. Yet the hours of labor have not decreased to any extent, and especially where the union has been crushed in its efforts for shorter hours, as at Homestead. Take the great Steel Trust, if you please. View the immense labor-saving

devices it has installed in the last ten years, which must have thrown out of employment many hundreds of men. And according to the petition in the case of the United States against the Steel Trust, its profits in those ten years were equal to about nine hundred and eighty million dollars. Yet the hours of labor are the same as they were ten years ago. Don't you think there is food for thought as to why this army of unemployed? Then let me tell you again, in closing, that labor demands shorter hours of work and more hours for intellectual development; and the demand is based upon economic facts.

IV

SAFETY AND HEALTH IN THE MINING INDUSTRY

Joint Session with the American Economic Association,
SATURDAY MORNING, DECEMBER 30, 1911.

Presiding Officer: WALTER L. FISHER
Secretary, Department of the Interior.
WASHINGTON, D. C.

DATA CONCERNING THE MINING INDUSTRY IN THE UNITED STATES

WALTER L. FISHER

Secretary, Department of the Interior.

The total number of men engaged in the mining industry in the United States is about one and one-half million, of which nearly one-half (725,000) were, in 1910, employed in coal mining. The following figures illustrate the extent and growth of the coal-mining industry in the three principal coal-producing countries:

UNITED STATES		GREAT BRITAIN		PRUSSIA	
PRODUCTION	NO. OF MINERS	PRODUCTION	NO. OF MINERS	PRODUCTION	NO. OF MINERS
1900—		1900—		1900—	
270,000,000	448,600	252,000,000	766,900	150,000,000	419,700
1910—		1910—		1910—	
502,000,000	725,000	296,000,000	1,049,400	221,000,000	633,400

In mine accidents, if considered in connection with the number of men killed for each one thousand men employed in the coal mines of these countries, the rate of loss of life in the United States is much greater than it is in Great Britain and Germany. If considered on the basis of the number of men killed for each one million tons of coal produced, the result is much the same in the three countries, the United States, in fact, on this latter basis, ranking between Great Britain and Germany. The difference in favor of the United States would be much greater but for the fact that the average number of days during which the coal miner is employed in European countries is at the present time at least thirty per cent greater than in the United States.

The Causes of Mine Accidents: In the coal mines of the United States, during 1910, 18 per cent of the deaths resulted from mine explosions, ordinarily designated as mine disasters. Of the total deaths in coal mines 35 per cent were caused by accidents from mine cars, electricity, and other conditions, which killed one, two, or three men at a time. Of these fatalities 47 per cent were from falls of roof and falls of coal, which killed one, two, or three men

at a time. Contrary to the general supposition, the death rate for each one thousand men employed in the metal mines and quarries of the country is almost as great as it is in the coal mines.

About thirty thousand men have been killed and about sixty thousand injured in the mining industry of the United States during the past ten years.

The Waste of Resources: It has been estimated on the best available data that in connection with the mining of coal in the United States, from the beginning of this industry down to the present time, 2,000,000,000 tons of anthracite coal and 3,000,000,000 tons of bituminous coal have been left underground in such condition that its ultimate future recovery under any ordinary conditions will be impracticable. It is also estimated that in connection with the mining of coal during a single year (1909), there was wasted or left underground in a condition which makes its future recovery doubtful, if not impossible, 80,000,000 tons of anthracite and 200,000,000 tons of bituminous coal; and that the waste in natural gas during this same year (1909) aggregated 480,000,000,000 cubic feet, in addition to the waste of valuable gas in the manufacture of coke amounting to 120,000,000,000 cubic feet. In the utilization of these mineral fuels, and again in the mining and treatment of ores and other mineral products, the wastes or losses aggregate from twenty to fifty per cent of the total production.

The problems connected with the prevention of the loss of life and the prevention of the waste of resources in the mining industry are so intimately associated, the one with the other, that they need to be considered and dealt with together.

THE WORK OF THE UNITED STATES BUREAU OF MINES

J. A. HOLMES

Director, United States Bureau of Mines.

The Bureau of Mines is but a year and a half old. Probably not since the establishment of the Department of Agriculture has any branch of the government service been created in response to a demand so general as that for this bureau, intended to take up investigations looking to the prevention of the loss of life and of the waste of resources in the American mining industry.

Mining has developed so rapidly in this country that those most familiar with it have scarcely been able to keep pace with its progress. Mining and agriculture, as you know, are the two foundation industries, and both of them in their growth have kept pace with the progress of the country itself. The products of our mines now compose at least 60 per cent of the total freight traffic of the United States and have an average annual value of not less than \$2,000,000,000; and the industry employs something more than one and one-half million men, of which number nearly one-half, or 725,000, are engaged in coal mining. The Bureau of Mines, therefore, has to do not only with the saving of life, but also with a number of the larger economic problems of the country; for, whether we consider manufactures, transportation, or commerce, we are dependent upon the products of the mines.

The Bureau of Mines is so young that the results of its work can hardly be discussed; but I may describe briefly its purposes, its plans, and what it is trying to do. First of all we should understand that the bureau has no authority to do anything except conduct inquiries and investigations, publish reports, and give advice. The questions connected with the supervision or inspection of mines remain with the states as part of their police control. The two great purposes for which the Bureau of Mines is authorized to conduct inquiries and investigations are: to safeguard the lives of the miners, and to prevent unnecessary waste in the utilization of our mineral resources.

As bearing upon the problems of safety, the bureau is endeavoring first of all to collect statistical data to show the health conditions in and about mines and metallurgical plants, and the nature and extent of the accidents that happen to men in those mines and plants. After this information is obtained, the next step is to conduct such investigations as will indicate how the health conditions may be improved and the number of accidents reduced, and how great mine disasters, whether from fires or explosions, may be entirely prevented. The third step is to deliver this information to the mine owners and mine workers in such form as will make it readily acceptable and useful to them. This latter is the educational part of the work.

One of the first subjects taken up by the bureau was that of mine explosions. This investigation, which is now being actively pushed, involves a study of mine gases and coal dust, and the conditions under which dust and gas may be ignited in a mine. The bureau has collected samples of dust and gas from all the important coal-mining districts of this country, has carefully examined these samples, and has investigated the possibility of igniting the different types with mine lamps, electric sparks, or the powder and other explosives used in coal-mining operations. For these investigations laboratories have been equipped, large steel galleries have been constructed, and an experimental mine is being opened up. This mine, which consists of a double tunnel or double entry that is being extended a distance of some two thousand feet into one of the beds of coal near Pittsburgh, is to be used for experiments and demonstrations to supplement the results obtained on a smaller scale in the laboratories.

The best developed of our investigations, probably, is that of explosives used in coal mining. The bureau started out in the belief that all explosives are dangerous, and that the black powder so generally used for mining coal in this country is especially dangerous in gaseous mines, because of its long, slow flame. It, therefore, early took up with the manufacturers the question of producing new types of explosives, which would have a flame of short duration and low temperature, and, as a result, be less likely to ignite gases or inflammable coal dust. So heartily have the manufacturers of explosives coöperated in this plan that already

nearly a hundred new types of explosives have been developed by them, and during the past year more than 12,000,000 pounds of these new explosives have been used in the coal mines of the country as a substitute for the more dangerous black powder.

The bureau has also taken up the question of electric installation in mines, and as a result of its inquiries and investigations during the past year has recommended, and is to a considerable extent securing, the introduction of methods which will reduce the number of accidents from this cause. Miscellaneous mine accidents, such as those caused by falls of roof, failure of safety appliances, mine cars, etc., have also been considered. The great mine disasters attract especial attention because of the large number of deaths involved in a single disaster; but it is these miscellaneous accidents, killing one, two, or three men at a time, that make up the larger part of the death roll of our mines.

Although we regard accident prevention as of much greater importance, the rescue work of the bureau has probably attracted more public notice than any other phase of its activity. So long as accidents occur, men who may thereby be entombed in mines must be rescued; and those who are injured, whether from fires, falls of roof, or other causes, must receive immediate attention. It is impossible, of course, for the employes of the Bureau of Mines to do much in the way of actual rescue and first aid. This work, to be effective, must be done promptly; and it must be done, therefore, by men who live at and work in the mines. The Secretary of the Interior will join me in assuring the members of the two associations here assembled that the plans of the Bureau of Mines do not contemplate the building up of a great mine-rescue and first-aid force to be supported out of the federal treasury. The work of the bureau is pioneer demonstration work, training the miners to rescue and give first aid themselves, and showing the mine owners how to supply the miners with the necessary equipment and appliances.

At first the bureau organized several mine-rescue stations, and it has now in operation six such stations. At each of these is a practical miner, trained in mine-rescue and first-aid methods, whose chief work is to train other miners who come to the station from adjacent territory. But by far the most important work of the

bureau along these lines is carried on by its mine-rescue or mine-safety cars, of which there are seven, one in each of the more important coal fields of the country. Each of these cars is supplied with mine-rescue and first-aid equipment and supplies, and carries a mining engineer and two practical miners, who are trained in rescue and first-aid methods. Each car in its own field travels from one mining camp to another, spending a week at a place, and training in that week from ten to fifteen local miners in these rescue and first-aid methods. It is expected that eventually the mine owners at these places will purchase the necessary equipment, and that the miners who have been trained will be organized into a local mine-rescue and first-aid corps, equipped and supported by the local mine owners. In case of a disaster these trained local miners, already familiar with conditions in the district, are on hand and ready to enter the mine at once for both rescue and first-aid work. These cars are rendering splendid service. But we need two or three more of them, and more equipment on each car. If the work is properly provided for, it is believed that within a few years the bureau will have trained and organized a great rescue corps of 50,000 miners to be supported without cost to the federal government.

Meanwhile, however, the chief work of the Bureau of Mines is endeavoring to find out how disasters may be prevented, so that as the years pass by the need for mine-rescue work may grow less. But the men who are injured from accidents that occur in spite of all these efforts should be cared for in the manner indicated.

The success or failure of the work of the Bureau of Mines in behalf of safety will depend largely upon whether or not it secures the active, hearty coöperation of the mine workers and mine owners of the country. Already a good beginning has been made. The part of the federal government, it is recognized, is simply to conduct inquiries and investigations and to make known the results in a practical way. The work of the states consists in securing the necessary mine legislation embodying the results of these investigations, and the necessary force of intelligent inspectors who will see that the state laws and regulations for the protection of the miner are properly enforced. Both these branches of work are essential; but equally essential to ultimate success is the coöperation

of the mine worker and the mine owner, not only in carrying out these recommendations, laws, and regulations, but in doing everything else possible looking to the improvement of health and safety conditions in and about mines.

Naturally, as in all great movements of this kind involving so large a number and variety of men, progress is slow; but I believe that real progress is being made. Good-will and coöperation are becoming more and more evident; and within a few years there should be a marked reduction in the number of mine accidents in this country.

Meanwhile, there is serious need for extension of the work of the bureau. Its investigations up to the present time have been largely confined to the more serious health and safety problems about coal mines. But there is great need for the extension of this work to metal mines, quarries, and metallurgical plants. The loss of life in the metal mines of the United States is almost as large as the loss of life in the coal mines and in some states larger; and the loss of life in our quarries and metallurgical plants is far greater than it should be, and much greater in the United States than in other mining countries.

The great problems connected with the waste of resources have scarcely yet been touched. We have found, as stated to you by the Secretary of the Interior in his opening address this morning, that this waste is of such large proportions in the coal fields of the country that in our mining operations of the past year we wasted or lost not less than 200,000,000 tons of bituminous and 80,000,000 tons of anthracite coal. During the same year we turned loose into the atmosphere about 480,000,000,000 cubic feet of natural gas, the finest of all our mineral fuels; and the waste in our metal-mining and metallurgical operations aggregated from twenty to more than fifty per cent of the total product. We must not forget, moreover, that of these mineral resources we have only one supply. If we lose a crop of wheat, we may produce another crop the next year. If we destroy a forest, within a few decades we may have another forest growing on the same ground. But when once our supply of coal, or natural gas, or petroleum, or any other important mineral substance has been destroyed or exhausted, we have no means of producing another supply to take its place, except as we may bring it in at enormous cost from other countries.

We cannot leave it to the individual to solve these problems of mineral waste, for the individual frequently makes larger profits almost in proportion as he follows more wasteful methods in mining. His profits per ton in mining coal are often greater if he only tries to take out half the coal than they would be if he undertook to bring it all to the surface. The interests of the individual are always more or less local and temporary, and his purposes and ambitions for the most part relate to temporary gain. It, therefore, becomes the duty of the general government to conduct such inquiries and investigations concerning the use of these resources as will keep the general public well-informed as to what has been done, what is being done, and what can be done toward the prevention of unnecessary waste. No one doubts the correctness of the statement that mineral resources are essential to the proper development and to the permanent welfare of the nation, and no one who appreciates the wasteful methods of the individual can fail to appreciate the fact that the nation and the states must take the steps necessary to prevent unnecessary waste in the use of these resources. The nation and the states must coöperate in perpetuating their own permanent welfare.

OCCUPATIONAL DISEASES IN THE MINING INDUSTRY

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While the subject of occupational diseases in the mining industry is of great interest, I feel some hesitancy at this time in attempting to present an account of the investigations carried on by me in Colorado during the past summer. This is due to the fact that the studies have not as yet been completed nor the data collated or sufficiently digested to draw detailed conclusions. The investigations mentioned were undertaken and conducted through the joint co-operation of the United States Bureau of Mines and the United States Public Health and Marine Hospital Service. It is recognized by both bureaus that the health of miners and the sanitation of mines must of necessity have an important bearing on the economic aspects of mining and on the health of the country generally.

More or less interest in the question has been manifested in different sections of the country, as is evidenced by investigations and demonstrations of the presence of hookworm disease in the coal regions of West Virginia and in the gold mines of California, and by the suspicion, among agencies for the prevention of tuberculosis of the undue prevalence of affection of the lungs among miners, especially in the metalliferous mines. It is also known that, in certain sections at least, insanitary conditions prevail in mines; and the great loss of life that frequently occurs as a result of explosions, noxious gases, and the falling of rock, is a matter of common knowledge. In fact, it is becoming more and more apparent that the health of employes has an important bearing on the prosperity of the industries in which they are engaged. These reasons and the desire to protect the health of miners and to render their labor more effective led to the inauguration of the investigation.

In accordance with official orders, the past summer and fall were occupied by me in investigations in Colorado of conditions of

the mining industry affecting the public health, particularly with reference to the prevalence and causes of diseases of the lungs among miners. A brief portion of this time was devoted to studies of the coal mining industry in that state, and twenty-five coal mining camps and the underground workings of seven mines were inspected. Other officers, however, had previously undertaken investigations of the coal mines of West Virginia, and it was the original intention to confine the work in Colorado to a sanitary survey of the metalliferous mines.

The work in relation to metalliferous mines included inspections in eight of the principal mining districts, examinations of the underground workings of twenty-six mines, and examinations of the chests of four hundred and seventy miners and mill men. A large number of mine operators, foremen, miners, physicians and others connected with the industry were interviewed. A study was made of existing statistics collected by state and local authorities, and studies were undertaken to determine the extent of migration of miners, especially of those affected with pulmonary diseases.

Consideration of the subject of occupational diseases can not confine itself to diseases distinctly attributable to the hazards of the occupation. It must of necessity include a much broader field. That is, in addition to the dangers while actually at work, social and economic conditions have an important bearing.

Among the occupations of importance from a sanitary standpoint are those involving exposure to air vitiated by respiration, to irritating and poisonous gases and fumes, to irritating and poisonous dust, to infective matter in dust, to offensive gases and vapors, to extremes of temperature, moisture and pressure, to poverty, and to filth. It was attempted to collect data to determine the extent to which these conditions prevailed in the metalliferous mines inspected, and their bearing on the incidence of lung diseases.

It is well known that persons engaged in certain dusty occupations are more subject to diseases of the lungs than are persons in less dusty occupations. Hard, insoluble dust particles, having sharp edges and corners, are believed to be more injurious to the lung tissue than are particles which are comparatively free from these sharp points. Coal dust is of this latter type, while the dust of many metalliferous mines conforms to the former type. Comparisons

may therefore be made of the two industries. It has been found in England and Wales that the percentage of mortality from diseases of the respiratory organs was only about four-fifths as high among coal miners as among all males, while the percentage mortality from these diseases among Cornish metal miners was exactly three and one-half times as high as that of coal miners. In the districts of Colorado that were investigated the percentage mortality from lung diseases, during the years 1902 to 1910 inclusive, was more than four times as high among metal miners as it was among coal miners. Studies are being made of the mortality from these diseases among miners as compared with that of the general adult population of these districts.

Metal mining is classed as one of the dusty occupations, and we would therefore naturally expect to find a high prevalence of lung affections among the persons engaged in it. Other factors than dust, however, must be considered. The metal miner works in an atmosphere which frequently contains noxious and poisonous gases; he sometimes works in ores containing chemicals which may cause toxic effects; and, under the conditions which prevail in all but a few mines in Colorado, he is frequently exposed to sudden and wide variations in temperature. Other conditions, moreover, incident to the life of the miner, tend to lower resistance and may thus predispose to lung diseases.

The principal occupational diseases of miners which will be discussed at this time, are:

1. Those induced by the inhalation of dust, known as silicosis among metal miners and as anthracosis among coal miners.
2. Those induced by noxious and poisonous gases, the symptoms of which depend on the kind of gas inhaled.
3. Those diseases or intoxications caused by poisonous metals contained in the ores being mined, lead poisoning being the principal one.

The two latter groups, by lowering resistance, may be predisposing causes to miners' phthisis or to silicosis among metal miners.

It is difficult to ascertain the actual amount of miners' phthisis. Frequently miners will not submit to a physical examination; and studies of the death records give incorrect results, since men affected with miners' phthisis frequently die from accident, pneumonia, or

some other cause, and no mention of the miners' phthisis is contained in the death certificate. Yet I found in one district in Colorado that this preventable disease was recorded as the chief or contributory cause of 30 per cent of the deaths which had occurred among miners there during the past nine years, while the mortality from all respiratory diseases was 56 per cent of the total mortality reported among these miners. Nor does this tell the whole story, for it is customary for some of the miners, when they become short of breath, to leave the mines and go to a lower altitude. If the deaths among these men were added to the figures just given, the mortality from lung diseases would be increased very appreciably. In this same district, it was found that the death rate from lung diseases contracted in Colorado was more than three times as high among miners as among the rest of the adult population.

Miners' phthisis is very prevalent among metal miners in various foreign countries, especially among Cornish miners in England and among the miners on the Rand in South Africa, where it is stated that 25 per cent of the European miners suffer from phthisis in the various stages of the disease.

Mention must be made of tuberculosis and pneumonia among miners. While these may not be classed as distinctively occupational diseases, they are undoubtedly responsible for a large number of deaths among metal miners. It is not difficult to see why this should be so when one considers the conditions under which the miner carries on his occupation, and it is quite probable that a man suffering from miners' phthisis is more liable to contract either of these diseases, especially the former, than a man not so affected.

An important and rather frequent cause of death among miners appears to be poisonous gases formed by the imperfect detonation of high explosives. My attention was especially called to this while in the Cripple Creek district, where a man died of oedema of the lungs, probably as a result of exposure to powder smoke. The symptoms were those of acute poisoning by nitrogen compounds, and the diagnosis was confirmed by post-mortem examination. In this same district report was received of twenty similar cases within a period of ten years, all but two of them fatal. Similar cases were also reported to me as having occurred in the Leadville district, and there is record of nine fatalities attributed to the effects of the in-

halation of powder smoke, out of a total of thirteen men who were exposed to the fumes while working in the Gunnison Tunnel.

Men working in mines are frequently exposed to powder smoke. In some mines shots may be fired at any time, though the great majority are fired at the end of the shift. Some of the mines visited work three shifts in twenty-four hours; others, which work only two shifts, send the second down within an hour after the first comes out; in both cases men go into the mines while the atmosphere contains considerable powder smoke. There is thus abundant opportunity for exposure to whatever deleterious influences such gases may exert.

Although it is stated by some writers not to occur, mention must be made of lead poisoning among miners of lead ores. Reports were received by me of cases of lead poisoning in practically every lead mining district visited. In Leadville records were available of thirty-nine diagnoses of lead poisoning among miners treated at St. Vincent's Hospital during the past four years. Physicians in other mining camps spoke of lead poisoning as of rather common occurrence among miners. And a number of the men examined by me, who had miners' phthisis or ill health from other causes, attributed its beginning to an attack or to attacks of lead poisoning which they had had some years previous, and stated that their health had not been as good since they were "leaded". It seems probable, therefore, that lead poisoning does occur among lead miners in Colorado.

There is another class of diseases and infections to which miners are especially subjected where the temperature and soil conditions are favorable for their development. I must refer briefly to the general class of soil-pollution diseases. Under this term may be included all those infections which spread in and from soil which has been polluted by human discharges,—for instance, typhoid fever, the dysenteries, Cochin China diarrhea, hookworm disease, etc. There are perhaps no diseases that are theoretically so easily preventable as these, and the most important single factor in preventing them is a safe disposal of excrement. Other things being equal, these maladies will spread under poor sanitary conditions, either in the mines or in the camps, and they will be inhibited directly in proportion to the care taken in safe-guarding the disposal of excrement.

The presence of typhoid fever in a mine camp is of importance, not only to the mine and the camp itself, but to the lower lands through which the stream runs that may be polluted while passing through the mine village. Considering the wandering character of many of the men employed in the mines, moreover, it is clear that the disease may be carried by these men from an infected locality and, finding favorable conditions, may infect the new locality to which they migrate.

Hookworm disease has been found very prevalent in the mines of various foreign countries, and its eradication has already cost some foreign mines thousands of dollars in loss of labor and for medical attendance. The St. Gothard's tunnel epidemic may be mentioned as one of the well-known outbreaks of disease caused by this malady. The German mines have instituted a vigorous campaign against this infection, with compulsory examination of all the men in mine work and compulsory treatment of all those affected. By carrying out this campaign every year the disease has been greatly decreased among German miners. Hookworm disease is so prevalent among miners in some countries that it is frequently called "miners' anemia".

As has been established, hookworm disease is decidedly common in certain parts of the United States. The infection has been identified in only rare instances as yet in the mines of Pennsylvania. It has been found in the mines of Virginia, West Virginia, North Carolina, Nevada and California. In the examination of 273 specimens from men employed in the mines of Colorado, I did not establish the presence of the disease in that state. It is extremely important for us to realize, however, that unless mine sanitation is improved the disease may gain such headway in some of our mines that we can eradicate it only with years of work and at great expense, and further that if it becomes a serious medical feature among the miners it will decrease very seriously their earning capacity. In the mines of West Virginia it has been established that Cochin China diarrhea is present in miners and that it may develop underground, thus giving the conditions necessary for its spread while the men are at work in the mines.

Brief mention will now be made of some of the conditions in the mines of Colorado which may have a direct bearing on the health of the miners. The ventilation of the metal mines is, with a few

exceptions, wholly dependent upon atmospheric conditions at the surface. In many of them the ventilation is good most of the time in the main levels and stopes, and is more or less satisfactory in the blind drifts, especially if machine drills are being used. In some mines, however, the atmosphere is at times so deficient in oxygen that a candle will not burn. A number of miners have told me that they have frequently had to lay their candle on its side or to move it several feet away from the breast of the drift, where the air contained more oxygen, in order to have it burn. In one mine that was working I walked more than one hundred feet in the dark. My candle would not burn, and matches, when struck, would only sputter and go out. I was told that some of the men use both a candle and a carbide lamp in this mine, and that they do not stop working when the candle will not burn, but keep on by the light of the carbide lamp which requires less oxygen.

In the majority of the mines the compressed air supplied to machine drills is taken from the outside air. In some mines, however, it is taken from within the compressor room or within the mine. Compressed air taken from either of these last named sources may be of very little aid in ventilation. There are some single-shaft mines, some single-tunnel mines, and some mines which have good air connections on the upper levels but only one air shaft or air course to the lower level or levels. Some of these have a small fan which aids in the ventilation of these lower levels, but the majority depend upon natural ventilation for their supply of fresh air. The ventilation of many of the metal mines of Colorado, indeed, leaves much to be desired. But the coal mines that I inspected were well ventilated.

Dust in the mine atmosphere varies greatly in character and amount in different districts, different mines, and different parts of the same mine. In some mines the rock is damp, and little or no dust is formed. In others, where the rock is dry, large amounts of fine dust are discharged into the atmosphere during the drilling, blasting, and handling of the rock and ore. But little effort is made to prevent the formation of dust or to prevent the inhalation of dust particles by the miner. Drills which force water into the holes are used in some places in drifting; yet I was told by men who use them that they do not turn on the water until they have drilled

four or five inches. A large amount of dust can be formed during this dry drilling. In working with a piston drill water is never used in the back holes and frequently all the holes are kept dry. Of late, moreover, the machine hammer drill, without water, is being used in drifting. The dust and drillings are blown out of the hole by means of compressed air. This creates an excessive amount of dust in dry rock. In a drift where one of these drills was in operation there was so much dust that it was impossible to see the strong light of a carbide lamp fifty feet away. Overhead stoping is the principal method of stoping employed in Colorado. In this, all the holes drilled have an upward inclination, and a large amount of dust may be formed. "Rises" are often made in these mines. Working in a "rise" is probably the most dusty operation in mining. Very few miners wear respirators or have any other protection against dust.

Change houses, in which men have facilities for washing and for changing and drying their clothes, are provided at very few mines. At some, excellent change houses exist, but at most of them the change house consists of a small room equipped with a heating apparatus, several benches, and pegs on the wall for hanging clothes, and has no facilities for washing. The men remove their outer working clothes here, but do not, as a rule, change their damp under-clothing until they arrive at their habitations, which may be at a considerable distance from the mine, frequently several miles. The winters in these districts are usually very cold and the exposure incident to traveling through the cold air, wearing damp clothing, is considerable, and may be a menace to the health of the miner.

The sanitary conditions in the mines leave much to be desired. No sanitary conveniences were provided in any of the coal mines that were inspected and little if any effort was made to keep them in a sanitary condition. In some of these mines the conditions are favorable for the spread of the soil-pollution diseases before mentioned.

The prevention of a large amount of disease can be brought about by improvement of the conditions under which the miner carries on his occupation. The measures necessary to improve these conditions are well described in the report of the Transvaal

Miners' Phthisis Commission, which says: "It is urgently necessary,—

"1. To prevent the discharge of minute, hard, angular particles of dust into the mine atmosphere.....

"2. To supply the working places throughout the mine with air in sufficient quantities and in such a manner as to render harmless and sweep away all vitiated atmosphere.

"3. To maintain underground workings in every mine in a clean sanitary condition and to provide for this a suitable sanitary system.

"4. To provide change houses suitably warmed and within reasonable distance from each shaft where the miners can dry and change their clothes.

"5. to provide that the air intake (of cylinders of compressors) be outside of the engine room so as to ensure a prime supply."

The successful application of these measures in any mining district will depend largely on the education of the miner in matters of hygiene, on the potential prosperity of the mine, on the adequacy of mining laws, and on an efficient public administration.

A FEDERAL MINING COMMISSION

JOHN RANDOLPH HAYNES

Special Commissioner on Mining Accidents, State of California.

Of all the nations of the earth, America is the most wasteful of the lives of its citizens. Accidents kill each year 75,000 of our people, of which number 35,000 are workmen slain while engaged in their daily occupations. If we add to these figures the number of the wounded and crippled in industry, we shall find that Mr. Mercer, of the Minnesota Employes' Compensation Commission is not far wrong in claiming that industry now kills and cripples more each year than did bullet and shrapnel in any year of the Civil War. Of all American industries, coal mining is the most hazardous. From three to five thousand coal miners are annually killed outright, and the number of killed and seriously injured combined amounts to from eight to ten thousand each year in the United States. Since 1890 more than 30,000 coal miners have been killed, and more than 80,000 have been seriously injured. In the single state of Pennsylvania, in the year 1907 alone, more than 1,000 miners were killed, leaving nearly 1,000 widows and 3,410 children under ten years of age.

Now this would be a frightful story to relate if it were necessary and inevitable, but as a matter of fact it is not at all necessary. The leading mining experts both of America and Europe tell us that it is perfectly practicable to prevent most of this loss of life. Mr. Joseph Holmes, Director of the Bureau of Mines, declares that three-fourths of this loss can be easily prevented. In view of these facts it becomes a question whether these fatalities, which can be so readily foreseen and so easily prevented, ought to be called accidents; some day we may come to regard them as little better than murders. While the average annual death rate from mining accidents in Europe runs per 1,000 men employed below 2, and in the case of France and Belgium is less than 1, in the United States the rate in 1907 was, for the single year, 4.86 lives lost for each 1,000 men employed; in other words, our death rate in that year through

mining accidents was about five times that of France and Belgium and about three times that of other European countries.

Perhaps the most discouraging feature of the whole situation is the fact that statistics show that, while the death rate during the past ten or fifteen years has been steadily decreasing in every European country, it has been steadily increasing in the United States. The death rate by accident per 1,000 miners employed has decreased in the eleven years from 1895 to 1906, in Prussia from 2.54 to 1.94; in England from 1.49 to 1.29; in Belgium from 1.40 to 0.94; and in France from 1.07 to 0.84. In this same period the death rate in American mines steadily increased from 2.67 deaths per 1,000 miners employed in 1895 to 3.40 deaths in 1906, and in 1907 this already frightful rate leaped, as we have seen, to a figure hitherto unheard of in the history of mining,—4.86; or practically 5 out of every 1,000 miners in the United States were killed by accident in the single year. The death rate per 100,000 tons of coal mined has also similarly increased. In Pennsylvania, where the number of mining fatalities amounts to from one-third to one-half of the entire number occurring in the United States, there was killed in 1899 one miner for every 215,587 tons of coal mined, and in 1908 one miner for every 167,066 tons, both, of course, under state regulation. "These figures indicate clearly the need of drastic measures to improve mining conditions," says James E. Roderick, chief of the department of mines of Pennsylvania, in his report to the governor in 1908.

In the last three years a slight improvement has taken place, but not enough to alter the general situation. The question arises, are the natural conditions in American mines more dangerous than those found in Europe? The truth is that quite the reverse is the case. Three distinguished European experts, Messrs. Victor Watteyne, inspector-general of mines, Belgium; Carl Meissner, councillor for mines, Germany; and Arthur Desborough, inspector of explosives, England, who were permitted by their respective governments to accept the invitation of the government of the United States to make an examination of American mines, after an extensive investigation in the year 1908, unanimously reported that the natural conditions in American mines were much better than in Europe. They found, for example, that up to the present time Americans were not operating in the very deep levels of 4,000 feet and lower, not uncommon in Europe, where the task of supplying

fresh air and getting rid of dangerous gases is very difficult. In America, also, only thick seams more easily ventilated are, as yet, generally worked. Moreover, the supply of timber for supporting the rock roofs, as compared with Europe, has been up to the present plentiful and cheap. Of late years, with the gradual exhaustion of higher levels, of the thicker seams, and of the supplies of supporting timbers, conditions have come to resemble more nearly those found in Europe, and it is for this reason that the percentage of fatalities has so rapidly increased in the past decade.

As yet, however, our natural conditions are far better than those encountered by the operators of Belgium and France, according to these European experts, and the fact that our fatalities exceed those two countries by a percentage of more than five to one, and in absolute number exceed the total of the whole world outside our nation, is due, these gentlemen were compelled to admit, to the almost unbelievable state of carelessness, negligence, and ignorance which they found generally prevalent in the mining industry of the United States. This condition will never be materially or permanently remedied until a department of the federal government is established which shall be vested with the actual power of controlling mining methods, to the end that the lives of the miners shall be safeguarded.

Before going into the question of the nature and jurisdiction of such a tribunal, it may be of advantage to look into a few of the faults characterizing American mining, which these European experts discovered in their investigations. As compared with European mining methods, they found, briefly, the following: ignorance on the part of mining superintendents, ignorance on the part of miners, slackness in the rules regulating the use of safety lamps, carelessness in permitting the accumulation of dry coal dust, use of coal dust in tamping charges, negligence of state officials in acting upon the reports of inspectors, incompetence of state inspectors, carelessness in the arrangement and use of electricity in mines, use of improperly compounded explosives, use of excessive charges of explosives, use of wooden shaft structures, and failure to provide more than one opening to the mine.

First among the causes of the high fatality rate in American mines may be placed the ignorance and carelessness of superintendents and other mine officials. One of the European experts to whom I

have referred—whose name I am not privileged to mention—told me that, while passing through a mine in West Virginia with a party carrying both naked and safety lamps, he lifted his lamp toward the roof to test for gas and was surprised to find it present in very dangerous quantities. Turning to the mine superintendent, he remarked, "You should not allow naked lamps to be used in this mine." "Oh," replied the superintendent, easily, "we are installing a ventilating system that in a few months will rid the mine entirely of gas and render the use of safety lamps unnecessary." "Before that time arrives," protested the European expert, "your mine will be blown up." And this is precisely what happened. The naked lamps were not excluded, the mine was blown up a few weeks later, and hundreds of miners lost their lives. A hundred other cases, big and little, might be cited to show that our requirements as to the qualifications of mining superintendents, compared to those in Europe, are little better than a farce. Some of the states have nominal examinations and grant licenses to superintendents and foremen; but they are of little value, as is shown in the case of the large mine just mentioned. No European mining superintendent would dream of taking such chances as he foolishly took at the cost of so many lives; and, if he were so inclined, the government inspector would not permit him to do so. In another mine a foreman, testing in the early morning, found gas in dangerous quantities. Not being able to write, he laid a piece of iron across the railroad track before the entry, assuming that the miners would guess that it was a danger signal, and went to breakfast. The miners coming later not unnaturally failed to understand the purpose of the piece of iron. Supposing that it had come there by accident, they removed it from the track and passed on into the dangerous section, where every man lost his life.

In Europe a situation where a mine foreman could not read would not be understood. There every mining official is a man of intelligence, thoroughly grounded in the principles of his profession; no other can secure a license. Shall we go on in this country, clinging to our inefficient system of state regulation of an industry that is essentially interstate in character until we have uselessly sacrificed the lives of tens of thousands more poor miners, before we stop this slaughter under the only practical system of safety,—the federal regulation of the mines?

A second large contributing cause to the loss of life in American mines is the ignorance of the miners themselves. Not only are regulations in Europe very stringent as to the qualifications of the mining officials, but they contain rigid provisions forbidding miners to handle explosives, or to do any work that may imperil their own brothers' lives until after a long apprenticeship under the charge of experienced miners they have demonstrated their fitness to assume such responsibilities. In America, where almost anybody is considered good enough to be a mine foreman, what qualifications can we expect of the common miner? In some of the principal coal-mining states, American miners have almost disappeared; ignorant foreigners are cheaper; brought over by the immigrant steamship companies at a rate of \$25 a head or less, they are poured into the mines by the thousands. Coming chiefly from the agricultural districts of Europe and utterly ignorant of mining methods, they are at once entrusted with the handling of the most dangerous explosives, a license which, of course, would not have been permitted them in the countries from which they came.

In one mine in Pennsylvania 21 separate languages are spoken; many of the miners can read in no language at all; yet any one of these men, by his ignorance or carelessness, may cause the death of all the others; and the figures show that this does, indeed, often happen. Captain Desborough, the English mining expert, asked a workman in an American mine what he would do if his safety lamp showed the presence of gas in dangerous quantities. "Oh," was the ready reply, "I would put the lamp on the floor and go on with my work." One of the chief purposes of a safety lamp is, of course, to enable the miner to be warned when the amount of gas is dangerous. As the dangerous gases are more abundant, usually, above the floor level, he raises his lamp, and if the lengthening flame in the safety lamp indicates a dangerous proportion of gas, it is his duty to warn his fellow miners in order that all may flee for their lives. Such astounding and perilous ignorance as that of the American miner, who considered that the danger of gases could be avoided by placing the safety lamp in the better air near the floor, could not be encountered among European miners. The European miner must show his knowledge of the fundamental facts as to the nature of gas, the use and handling of safety lamps,

and of explosives, etc., or he will not be permitted to work. In America these ignorant men come to the mine free of expense to the operator; if they are slain, they do not cost much; miners' families are too poor to carry on damage suits dragging into years for settlement, with the likelihood of an unsympathetic judge throwing out the whole case on the ground of some technical defect in the drawing of the plea, or upon the ground of the "assumption of risk" or of the "fellow-servant" legalistic theories. The company claim agent, therefore, settles with the bereaved families for a few dollars a head, fresh thousands are poured into the mines, and the Lord above is depended upon to take care of them. After an explosion in a Virginia mine, in which many of the miners lost their lives, the survivors refused to work in a certain part of the mine, knowing it to be dangerous. A crowd of fresh immigrants, unfamiliar with the situation, were brought in, put to work, and soon after perished in a second explosion.

Mining superintendents are not heartless, but they are pressed for dividends by the presidents of their companies; the presidents are not heartless, but they are pressed for dividends by their directors, who live perhaps a thousand miles away in New York, and are interested in the mines only as a matter of profit. State mining inspectors would like to better conditions, but they do not wish to impose more burdensome regulations than do other states, all selling coal in a common, competing market. Moreover, they do not wish to lose their positions, which they are very likely to do if they annoy the owners of coal mines, who very commonly own the railroads which carry the coal, and enjoy intimate relations with banks and other corporations that exercise quiet but effective power in state politics.

Certain states, it is true, are more careful of the lives of their miners than are others. For example, in the twenty year period ending in 1908 the rate of mining fatalities for the whole country was 3.11 per 1,000 miners employed, while in the east central section, comprising western Kentucky, Indiana and Illinois, the rate was only 2.25 per 1,000 men employed. This is quite high compared with European states, but low compared with that of most American states. The western section, comprising the states of Colorado, Utah and New Mexico, showed a rate of 6.4, and the northern Pacific district of 7.4, while the single state of Colorado,

in the year 1910 just passed, has achieved the unenviable record of killing 21 out of every 1,000 miners employed in that year,—more than twenty times the annual death rate of France or Belgium. Efficient inspection and regulation will come only through the strong arm of the federal government, less subject to such influences, and able to impose regulations equal and the same upon the mining operators of all the states. The federal government can afford to equip and maintain bureaus of experiment and investigation of an efficiency, and secure scientific experts of an ability, such as are impossible to the individual states. An interstate mining commission would have no authority, of course, to prescribe the conditions of coal mining where the product is sold within the state where it is produced. In the case of some small mines, doubtless, their operations would not fall under the jurisdiction of the federal commission. The great majority of the coal mines of the country, however, would receive the protection of the safety regulations of the federal commission.

Another important contributing cause to mining accidents in America is the presence of coal dust, which through carelessness is allowed to accumulate. There is now no question among scientific men but that coal dust is explosive, and that to it may be traced some of the most frightful mining disasters in history. Among the first, if not the first, to experiment on this question was Mr. W. E. Garforth, manager of the Altofts Colliery, England. I was fortunate enough last year to witness as his guest the one hundred and fifteenth and one hundred and sixteenth experimental explosions conducted by him under conditions similar to those actually existing in the mines. This great-hearted Englishman related to me the origin of his interest in this subject. Some years ago he led a rescue party into his mine after an explosion, and when he came upon the bodies of the poor fellows, fathers and sons locked in each other's arms, the sight almost overcame him. He formed a resolution then never to rest until he had learned the causes of these terrible explosions. He has demonstrated beyond the shadow of a doubt the explosiveness of coal dust, and his conclusions have been corroborated by experiments conducted by the mining bureaus of the United States and other governments. Mr. Garforth has shown that, if the walls and floors of his mine are covered with stone dust composed of the pulverized shale commonly found ad-

jacent to coal-bearing strata, the coal dust, smothered by non-inflammable material, will not explode. The total cost for this protection amounts in his mine to only one-fifth of a cent per ton of coal mined. The lives of many hundreds of miners have been thus saved at only a trifling expense. In certain districts, such as the Longwall fields of northern Illinois, this smothering of the coal dust by stone dust is accomplished by natural means. In that district particles of shale are continually falling from the roofs of the mines. Crumbling to powder from exposure to the air, the shale dust becomes so mingled with the coal dust as to render the latter non-inflammable; and in the forty years in which this field has been worked, no explosion has occurred.

Various methods are now used to render coal dust non-explosive, —the use of stone dust as mentioned, the use of water or steam to keep the coal dust moist, and a combination of the two in a sort of shale whitewash which forms a protective coating over walls and floors. A state mining inspector in Alabama reported to the state officials, after each visit to the Virginia mine near Birmingham, that there was a large accumulation of dry coal dust in the mining hallways. These reports were correctly stamped and filed away in the proper pigeon-hole, until one day the coal dust became ignited, the bowels of the earth were torn asunder by a terrific explosion, and a few days later the bodies of 160 miners were brought to the surface. The inspector had made his examination all right; the state official had filed the report all right; the only trouble was that nothing was done about the coal dust.

Another fruitful cause of miners' deaths is the use of wooden structures in shafts of mines. On September 6, 1869, the wooden shaft of the Avondale Coal Mine, in Luzerne County, Pa., caught fire. Ten thousand people gathered about the conflagration, helpless to give aid. Finally the whole mass of burning timbers fell with a crash into the mine, setting it afire. One hundred and nine miners lost their lives. Such an accident would be impossible in Europe, where no wood is permitted in the shaft structures. The Avondale disaster occurred more than forty years ago. Did it deter coal operators from building wooden shafts? Not at all; the wooden shafts went right on building; many a miner since then has lost his life from the burning of wooden shaft structures erected since the Avondale disaster; and to-day nearly all shaft structures

in America are of wood. In Europe, as has been said, wooden shafts are not permitted. Experience has shown at frightful cost that these things can not be left to the volition of the operator or the miner or to the regulation of individual states. The national government must enact regulations and appoint inspectors to enforce them. An interstate mining commission is necessary to see that superintendents are competent and faithful; that miners understand the fundamental principles of their dangerous profession before undertaking their duties; that safety lamps are used where gas exists in dangerous quantities; that coal dust is kept wet, earth covered, or removed; that shooting in or off the solid is not permitted; that only permissible explosives appropriate to the mine in question, and only in permissible quantities, are allowed; that the use of electricity is carefully regulated; and that several openings to the mine are maintained. In the Avondale disaster just referred to, where the single opening into the mine was blocked by the burning shaft, another mine opening would have saved the lives of all. A separate opening, however, would have cost money. The bodies of the whole force, 109 men, were found back of a small embankment which in their last hours they had attempted to throw up to dam back the deadly gases. A large proportion of American mines to-day have but a single opening, rendering escape impossible if the shaft itself or the passageway to the shaft takes fire. The recent Briceville, Tenn., accident is one of many cases where a second opening to the mine would have saved hundreds of lives.

In Europe the one distinguishing characteristic of mine management is the careful, prudent foresight with which the miners' lives are safeguarded. In America the one universal characteristic is the reckless disregard of the morrow, the criminal disregard of the considerations of safety. The Cherry, Ill., disaster, in which over 250 miners lost their lives, was caused by a boy pushing a tramcar, loaded with hay for the mules, against an open torch stuck in the wall of the hallway. Such management in the case of either the hay or the lighting would have been impossible in any European mine. The Austrian consul, in rendering to his government a report of the catastrophe, charges the operators with criminal carelessness and negligence in seven different specified particulars.

Newly arrived immigrants are very cheap. While it would cost something, say one per cent per ton of coal mined, to make con-

ditions comparatively safe, the present system is perhaps cheaper. It is doubtful if the average miner killed during the last twenty years has cost his employer \$50 in damages paid to his dependents. If these men were slaves worth about \$2,000 apiece, as in ante bellum days, they would not have killed 30,000 of them in twenty years, bringing upon themselves a loss of \$60,000,000. They would have made their mines as safe as those in Europe, or else have gone out of business.

It is doubtful if there is a mine to-day in the United States which could pass the inspection which is required of all mines in Europe in the matter of careful, minute precautions against accidents. State regulation, for the reasons I have mentioned, will never solve the problem. We have had a good deal of state legislation in the past few years having for its object the lessening of dangers in mining; but it has been in just these years that the highest mortality ever known in the history of mining in any country has taken place in American state-regulated mines. In the Marianna, Pa., disaster, costing the lives of about 160 men, the state mining inspector had just completed his inspection, had pronounced everything in perfect condition, and had proceeded a short distance from the mouth of the shaft when a fearful roar shook the earth, and he turned to see the heavy iron cage from which he had just stepped out torn from its chains and hurled a distance of three hundred feet, bearing in its flight the bodies of the two men who had it in charge.

State inspection has never been efficient, is not now, and there is no reason to believe that it will become efficient in the future. The federal government must take hold of the situation and use compulsion. An advisory relation to the miners on the part of the federal Bureau of Mines is good, but it does not go far enough; it must not only be able to make recommendations, but it must be able to compel the mine owners to carry them out. A federal system of rescue stations equipped with oxygen helmets and other safety apparatus deserves great praise. The essential thing, however, is not to rescue survivors after an explosion has taken place, but for the representative of the federal government to be able to say, "Your mine is unsafe; you must do this, and this, at once, otherwise your products will be debarred from interstate commerce." Prevention, not cure, should be the policy.

Now, how should the federal government take hold of this matter? We advocate the following plan:

The establishment by congressional enactment of a permanent commission of, say five members, analogous in character to the Interstate Commerce Commission; this commission to have complete power to prescribe the conditions under which coal entering into interstate commerce shall be mined, just as the federal government at present passes upon the character and conditions under which meat products enter into interstate commerce. This commission should have power to appoint federal mining inspectors and to enact regulations for all coal entering into interstate commerce. Of the members, to be appointed by the President, three should be scientific men selected for their special eminence in the subject of coal mining, one a practical coal miner, and one a business man of experience in the mining and marketing of coal. This commission should be empowered: first, to appoint its own inspectors; second, to pass and enforce regulations protecting the lives of the miners; and third, to prevent the waste of coal in mining (now nearly one-half) for the benefit of future generations.

In the case of coal lands still owned by the nation—still one-third of the total coal area—protection of the miners can be most effectively secured by retaining the ownership in the hands of the whole people, and operating the mines either directly by the government or through leases containing provisions for safety regulations such as have proved so effective in saving life in European mines. The fact that private profit is eliminated under government ownership and operation would make it easier both to safeguard the miners' lives and to protect the consumer from extortionate charges.

Even under private ownership, however, there is much misapprehension as to the amount of the increase in the cost of production necessitated by safety precautions. Mr. Victor Watteyne, inspector-general of mines, Belgium, one of the European experts invited by our government to investigate American mining conditions, states that in his opinion the transformation of American mining methods, now extremely dangerous, so as to bring about a condition of comparative safety, would be attended by little, if any, increase in the cost of production. He remarks that similar dangerous conditions once existed in France and Belgium, now the safest coal-mining countries in the world, and that the safety regulations

which brought about this result were, when first introduced, bitterly opposed by operators on the ground of increased expense. To-day, he adds, the operators, once so hostile, are perfectly satisfied with these regulations, and admit that the increase in the cost of production has been trifling in amount. Mr. Roderick, in his report above mentioned, states as his opinion that with an additional cost of about one cent per ton of coal mined in Pennsylvania, safety precautions could be introduced which would reduce the number of fatalities one-half. In other words, of the 8,893 miners killed in Pennsylvania in the period from 1899 to 1908 inclusive, the lives of 4,447 could have been saved by merely increasing the cost of coal production to the extent of one cent per ton.

Even if the cost of production should be increased to a greater extent than is claimed by Mr. Roderick and M. Watteyne, humane and broad-minded operators will be willing to assume this extra burden, provided, of course, that it fall equally on all competitors, so that such expenditure can be charged up to the cost of production, along with labor, freight, etc., and thus be added to the sale price of coal.

The movement toward employers' liability legislation, now gaining strength in many states, will, moreover, render safety mining regulations more popular among employers; for if the employer is compelled to pay accident and death losses to the families of the killed miners, precautionary safety regulations will become an economical business policy. The broad-minded and humane employer under safety regulations will be placed on a footing of equality with his unscrupulous and inhumane competitor. It is only by clothing some competent tribunal with effective power that this tremendous waste of life will be brought to an end. And when we once realize the actual conditions we will put an end to them. When we read in the papers that some 350 miners were killed in the Monongah disaster, 250 at the Cherry mine,¹ as many more at Connellsville, and so on, the statements are mere figures to us; they have no human meaning. But if we could stand at the mouth of the mine upon its re-opening after an explosion and behold the seemingly endless column of charred bodies borne hour after hour

¹ *The Bulletin of the (United States) Bureau of Labor*, No. 90, p. 613, gives the number of miners killed at Cherry, Ill., November 13, 1909, as 266, and the number killed at Monongah, W. Va., Dec. 6, 1907, as 359.—Ed.

to the surface; if we could witness the long line of hearses on their way to the hillside burial ground; if we could hear the heartbreaking sobs of stricken widows mingled with the pitiful wails of little children bereft of their fathers; if we could go in the days that follow to the bare homes deprived of their breadwinners, and find the little children taken out of school to gain their little pittance in the coal breakers; if we could see these things we would realize that it is not a question of "states' rights" or "constitutionalism"; we would see that it is a question of protecting the lives and the homes of our humble workers.

When, after years of weak and inefficient state regulation of impure food products, the American people decided that they wished their lives and their homes protected by the strong and far-reaching arm of the federal government, all kinds of constitutional objections were brought to bear by the manufacturers of impure products. They feared for the future of our country if the constitution were to be so trampled upon at the expense of the sovereignty of the states. But when we decided that we wanted it, the lawyers found a way for us. Uncle Sam now places his inspectors in the packing houses of Kansas City and thereby protects the homes of New York and San Francisco. The question for us is, do we really want the lives and the homes of these poor miners protected? If we do—really earnestly, do—the lawyers will arrange the constitutional problems involved.

At the best the coal miner leads a hard life, in the depths of the mine, shut out from the light of the sun, breathing all day foul air and gases, prone by his occupation to tuberculosis and other diseases, living with his family usually in dirty, smoke-covered villages, bare of trees and vegetation,—all this for miserable wages, in order that you and I may enjoy our bright firesides, and that the business of the nation, through factory and railroad, may go on. Is it not the least that we can do for these poor fellows to see that the present farce of state regulation should not stand in the way of a strong interstate mining commission that will protect them against the useless, foolish, and unnecessary waste of life which now characterizes our American mining industry?

V

PROCEEDINGS OF BUSINESS MEETINGS

Friday Morning, December 29, 1911.

ANNUAL BUSINESS MEETING.

The annual business meeting of the Association was held at the Hotel Raleigh, Washington, D. C., Friday morning, December 29, 1911, with President Henry R. Seager in the chair. A brief report of work for 1911 was given by the secretary, Dr. John B. Andrews. (For this report see p. 163). A short resume of the treasurer's report was then read, and the report was ordered audited and printed. (For the complete report see p. 161).

Upon motion the president appointed the following committees:

Nominating Committee: Professor Charles R. Henderson, Dr. Alice Hamilton, Dr. I. M. Rubinow;

Auditing Committee: Mr. John Martin, Dr. Samuel McCune Lindsay;

Woman's Work: Miss Josephine Goldmark, Miss Edith Campbell, Professor Ernst Freund, Mrs. Florence Kelley, Miss Susan M. Kingsbury, Miss Mary Van Kleeck, Miss Anne Morgan, Miss Mary Dreier;

Industrial Hygiene: Mr. Frederick L. Hoffman, Dr. W. Gilman Thompson, Dr. Alice Hamilton, Dr. Henry Baird Favill, Dr. David Edsall, Dr. William C. Hanson, Professor Irving Fisher, Dr. F. F. Westbrook, Dr. Warren Coleman;

Unemployment: Professor Charles R. Henderson, Mr. William Hard, Mr. Terence V. Powderly, Mr. Otto Bannard, Mr. William Leiserson, Mr. Darwin J. Meserole, Mr. W. L. Sears;

Enforcement of Labor Laws: Mr. John Calder, Professor Charles R. Henderson, Professor John R. Commons, Irene Osgood Andrews, Mr. P. Tecumseh Sherman.

Mr. John Martin then presented the following resolutions, which were unanimously adopted:

ONE DAY OF REST IN SEVEN

Whereas the number of industries that are kept in continuous operation and the number of wage-earners who are regularly employed every day in the week in such industries have greatly increased in recent years;

Whereas the so-called Sunday Laws enacted in the first instance

to protect the Sabbath from desecration have not only, in the turmoil and rush of modern industrial conditions, failed to do that, but have also signally failed in protecting men from the debasing effects of continuous seven-day toil;

Whereas regular employment for eight hours or more a day on all seven days of the week tends to undermine the health, dwarf the minds and debase the morals of those engaged in it, by depriving them of the opportunity for reasonable rest, relaxation, and enjoyment with family and friends, which is craved by every normal person; and

Whereas several large companies have found it practicable, to adopt a system allowing one day's rest in seven to all employes in continuous processes; Therefore be it

Resolved, That this Association favors, and pledges itself to support legislation that will serve to protect industrial workers from being required or permitted to work regularly seven days in any week, and be it further

Resolved, That the president of this Association be directed to appoint a committee of five or more persons to draft a bill designed to accomplish this object, and that an earnest effort be made to secure the enactment of this bill into law in the several states.

In accordance with this resolution the following committee was appointed:

Committee on One Day of Rest in Seven: Mr. John Fitch, Rev. Charles Macfarland, Mr. Charles H. Cabot, Mr. Louis Brandeis, Prof. Ernst Freund, Mr. William D. Mahon.

The nominating committee then submitted its report, and the following officers were elected for the year 1912:

<i>President</i> , HENRY R. SEAGER, Columbia University.	<i>Assistant Secretary</i> , IRENE OSGOOD ANDREWS, New York City.
— <i>Secretary</i> , JOHN B. ANDREWS, Metropolitan Tower, New York City.	<i>Treasurer</i> , V. EVERIT MACY, New York City.

Vice-Presidents

— JANE ADDAMS, Chicago.	MORTON D. HULL, Chicago.
— LOUIS D. BRANDEIS, Boston.	J. W. JENKS, Ithaca, N. Y.
ROBERT W. DEFOREST, New York City.	FREDERICK N. JUDSON, St. Louis.
— RICHARD T. ELY, Madison, Wisconsin.	PAUL M. WARBURG, New York City
— SAMUEL GOMPERS, Washington, D. C.	— WOODROW WILSON, Trenton, N. J.

General Administrative Council
(In addition to the Officers)

Thomas Sewall Adams, Madison.	Leonard W. Hatch, Albany.
Felix Adler, New York City.	Rowland G. Hazard, Peace Dale, R. I.
Caroline B. Alexander, Hoboken, N. J.	Charles R. Henderson, Chicago.
Magnus W. Alexander, Lynn.	Robert Hunter, Noroton, Conn.
Leo Arnstein, New York City.	- Florence Kelley, New York City.
George E. Barnett, Baltimore.	Owen R. Lovejoy, New York City.
James D. Beck, Madison.	James A. Lowell, Boston.
Sophonisba P. Breckenridge, Chicago.	James M. Lynch, Indianapolis.
John Graham Brooks, Cambridge.	Charles McCarthy, Madison.
Daniel L. Cease, Cleveland.	William D. Mahon, Detroit.
E. J. Cornish, New York City.	John Martin, New York City.
Edgar T. Davies, Chicago.	Andrew Jackson Montague, Rich- mond.
John W. Davis, Clarksburg, W. Va.	Anne Morgan, New York City.
- Miles M. Dawson, New York City.	Thomas M. Osborne, Auburn, N. Y.
Edwin W. De Leon, New York City.	Charles E. Ozanne, Cleveland.
Edward T. Devine, New York City.	Simon N. Patten, Philadelphia.
Mary Dreier, Brooklyn.	A. J. Pillsbury, San Francisco.
Otto M. Eidlitz, New York City.	- Roscoe Pound, Cambridge.
Elizabeth G. Evans, Boston.	Perry F. Powers, Lansing, Mich.
Edward A. Filene, Boston.	Mrs. Raymond Robins, Chicago.
Bernard Flexner, Louisville.	- I. M. Rubinow, New York City.
Lee K. Frankel, New York City.	John A. Ryan, St. Paul.
John P. Frey, Cincinnati.	J. G. Schmidlapp, Cincinnati.
Andrew Furuseth, San Francisco.	Louis B. Schram, Brooklyn.
Charles F. Gettemy, Boston.	P. Tecumseh Sherman, New York City.
John H. Gray, Minneapolis.	- Henry L. Stimson, Washington, D. C.
Josephine Goldmark, New York City.	Helen L. Sumner, Washington, D. C.
John Golden, Fall River.	David Van Schaack, Hartford.
E. M. Grossman, St. Louis.	John Williams, Albany.
Alice Hamilton, Chicago.	Robert A. Woods, Boston.
Henry J. Harris, Washington, D. C.	

The president requested any member of the Association who planned to be in Europe during September of 1912 and could act as a delegate to the International Association for Labor Legislation, which meets in Zurich in September, to report the same to the secretary. Professor Henderson, Professor Freund, Dr. Charles Macfarland and Mr. Frederick Hoffman, signified their intention of being in Europe at the time specified.

Dr. I. M. Rubinow offered the following resolution, which was unanimously adopted:

COMPENSATION FOR FEDERAL EMPLOYEES

Whereas the federal government has not yet provided an adequate system of compensation for industrial accidents for federal employes, nor extended its present system to employes in all departments of the government service; and

Whereas the members of the American Association for Labor Legislation have learned with horror of the accident in the Census Bureau, by which Miss Houghton was scalped by a revolving shaft;

Resolved, That the American Association for Labor Legislation, assembled at its fifth annual meeting in Washington, D. C., hereby records its opinion that it is the duty of Congress to provide adequate compensation for Miss Houghton for the terrible injury she has sustained and to obviate the possibility of similar uncompensated injuries to federal employes in the future by enacting an adequate compensation law.

Professor Seager then presented a resolution on compensation for non-resident alien relatives of workmen injured in this country. After a slight amendment the resolution was unanimously adopted as follows:

COMPENSATION FOR NON-RESIDENT ALIENS

Whereas, at its meeting in Chicago in June, 1910, this Association adopted a resolution condemning the discrimination contained in the laws of Pennsylvania and Wisconsin in reference to the employer's liability to non-resident dependents of workmen killed in industrial accidents; and

Whereas, through legislation enacted in 1911 both of these states removed this discrimination; and

Whereas similar discrimination against non-resident dependents has been a feature of some of the states' compensation laws and is contained in the proposed federal bill submitted by the federal commission; Therefore be it

Resolved, That the American Association for Labor Legislation regards such discrimination as unnecessary and unjust and as calculated to put a premium on the employment of aliens, whose families reside abroad, to the exclusion of American workmen, and that it directs its Executive Committee to use all legitimate means to secure the amendment of compensation laws already enacted or that may be enacted in the future so that they will extend equivalent rights to compensation to non-resident as to resident dependents of workmen who may be killed through industrial accidents.

Dr. Andrews offered the following resolution, which was unanimously adopted:

PHOSPHOROUS POISONING

Whereas the use of poisonous phosphorus in the manufacture of matches causes among match workers a most loathsome disease of the bones of the face, known as "phossy jaw"; and

Whereas the use of poisonous phosphorus in the match industry is no longer necessary, and the United States is the only civilized country of commercial importance that has not already prohibited the use of this deadly poison by national legislation; and

Whereas there is now pending in Congress a bill introduced by Congressman Esch of Wisconsin, which if enacted into law would effectually prohibit the use of this dangerous poison in the manufacture of matches; Therefore be it

Resolved, That the American Association for Labor Legislation, in its endeavor to secure early action by Congress which will absolutely prohibit the use of this unnecessary poison in American match factories, and to give to the workers in this industry the same protection from unnecessary suffering and death that has been extended to the match workers in the other civilized countries of the world, pledges itself to do all in its power to secure early enactment of the Esch Phosphorus Bill.

UNEMPLOYMENT

At the meeting which was devoted to the discussion of the problem of unemployment, on Friday afternoon, December 29, the following resolutions, proposed by Professor Charles R. Henderson, were adopted:

Resolved, 1. That the president of the American Association for Labor Legislation be authorized to appoint a committee of five persons to represent this Association in its relations and correspondence with the International Association on Unemployment, and to name the chairman;

2. That this committee shall have power, in the name of this Association and through its central office, to diffuse information about the International Association on Unemployment, to secure members for it, and to nominate the delegates to the International Association on Unemployment; it shall be the duty of this committee to make a report of its activities each year to the American Association for Labor Legislation;

3. That when ten members have subscribed they shall constitute the National Section for the United States, and have authority to adopt regulations, subject to the approval of the Executive Committee of the American Association for Labor Legislation;

4. That the subscription shall be fixed at 10 francs (\$2) for each individual member, payable to the secretary of the American Association for Labor Legislation, it being understood that each person who pays this sum shall be entitled to a copy of the publications of the International Association on Unemployment.

In accordance with these resolutions, President Seager appointed the following committee:

Committee to represent the Association in its Relations with the International Association on Unemployment: Professor Charles R. Henderson, Mr. William Hard, Mr. William Leiserson, Miss Jane Addams, and Dr. John B. Andrews as secretary of the Association.

MEETING OF THE GENERAL ADMINISTRATIVE COUNCIL

The adjournment of the annual business meeting of the Association was followed immediately by a short session of the General Administrative Council, which elected the following members of the Executive Committee:

JOHN CALDER, Iliou, N. Y.
JOHN R. COMMONS, Madison, Wis-
consin.
HENRY W. FARNAM, New Haven.
ERNST FREUND, Chicago.
FREDERICK L. HOFFMAN, Newark,
N. J.
PAUL KELLOGG, New York City.

SAMUEL McCUNE LINDSAY, New
York City.
JOHN MITCHELL, Mount Vernon,
N. Y.
CHARLES P. NEILL, Washington,
D. C.
CLINTON ROGERS WOODRUFF, Philadel-
phia.

The President and the Secretary.

FINANCIAL STATEMENT

The receipts and expenditures of the Association, as shown by the Treasurer's report for the year 1911, are summarized in the following items:

TREASURER'S ANNUAL STATEMENT
January 1, 1911—December 31, 1911

Cash Received

Balance, Jan. 1, 1911, as reported.....	\$432.56
Received from membership contributions.....	19744.72
Contributions in 1910 for 1911 expenses, not included in 1910 statement.....	666.67
Received from sale of literature.....	437.21
Received for state branches.....	2087.31
Miscellaneous receipts:	
Refunds from excess postage, express, etc.....	198.82
(Total refunds \$499.87,—less refund of \$301.05, re- ceived in 1911, and credited in 1910.)	
	<u>\$23567.29</u>

Cash Paid Out

Printing:	
Bulletin of the Int. Labor Office.....	\$146.53
American Labor Legis. Review and Reprints.....	2747.56
Circulars, booklets, enclosures, etc.....	2094.28
Stationery and Office Supplies.....	1189.52
Postage	2763.89
Salaries:	
Administrative	\$6018.17
Stenographic	2177.61
	<u>8195.78</u>
Traveling Expenses.....	1117.24
Freight and Express	160.04
Telegraph and Telephone	244.50
Rent	1175.04
State Branches	2079.31
Dues, Int. Labor Office.....	200.00
Miscellaneous (books, clippings, drinking water, towel supply, and other office expenses).....	321.98
	<u>\$22435.67</u>
Balance on hand, Dec. 31, 1911	1131.62
	<u>\$23567.29</u>

V. EVERIT MACY, *Treasurer.*

CERTIFICATE OF AUDITING COMMITTEE

We hereby certify that we have examined the Funds, Books, Accounts and Records of the American Association for Labor Legislation, and find that the foregoing report of cash receipts and expenditures and balance on hand is correct.

JOHN MARTIN,

SAMUEL McCUNE LINDSAY,

Auditing Committee.

OUTLINE OF WORK

JOHN B. ANDREWS

Secretary, American Association for Labor Legislation.

The rapidly expanding work of our Association during the past year has pushed our offices into larger quarters, increased the office staff, increased the membership in spite of an advance in minimum dues from \$1 to \$3, increased the voluntary contributions proportionately, increased the size of our public meetings, and caused the establishment of a regular quarterly Review of American Labor Legislation. But opportunities for usefulness outstrip our resources.

Our active legislative work during the year has secured the enactment, for the first time in America, of laws requiring physicians to report cases of certain occupational diseases in six different states. These laws have interested many members of the medical profession who are now co-operating in drafting a standard schedule for reporting such injuries. Work on the schedule has in turn led to the classification of occupational hazards and harmful substances, and to the preparation of a tabulated list of the most important harmful substances and their effects.

Our vigorous campaign against the use of poisonous phosphorus in the manufacture of matches has perhaps done more than any other one thing in this country to call attention to the fact that occupational diseases as well as industrial accidents actually exist in America and require immediate consideration. A special study of lead poisoning in New York State has been made by the Secretary and plans are already under way to hold a second national conference on industrial diseases.

Our "Memorial on Occupational Diseases" and our volume on "Comfort, Health and Safety in Factories" have brought together in readily available form much new and valuable information, which has stimulated new investigations, and particularly has pointed out the need of greater care and greater uniformity in labor legislation.

Demands for additional up-to-date data on the subject of workmen's compensation for industrial accidents have been particularly

pressing throughout the year. The call for information on the legal regulation of woman's work has been increasingly urgent and a special report on the subject is now nearing completion. The subject of unemployment is also becoming an important one and requires more and more attention. Perhaps no subject, however, is deserving of greater study, and probably no problem promises more valuable returns within a reasonably short time than that of the more efficient enforcement of our labor laws. Interest in this subject is increasing and calls for co-operation are coming now from many states.

The problems and the opportunities of this Association in the immediate future are inviting. The ground work has been laid. Technical comparisons of existing laws may now give way, for the time, to more popular but not less careful studies. The organization machinery is installed and tested, even if it is not always well oiled. The financial support and the wide democratic membership foundation which we all desire will steadily increase however, if the Association continues to make good as an efficient agent in the never-ending campaign for the greater comfort, health and safety of the millions who work in factory, workshop and mine.

GENERAL PURPOSES

The American Association for Labor Legislation was organized in 1906 to do for the United States what the fifteen other sections of the International Association for Labor Legislation, with which it is affiliated, are doing for European countries.

The movement for labor legislation, of which this Association is the most significant fruit, is world-wide, and no argument should now be needed to justify it. Resting upon an intelligent understanding of present day labor conditions and tendencies, it commands the approval of all thoughtful citizens.

To appreciate the need for labor legislation is simple. To devise regulations, which shall be enforceable and which shall not unduly hamper industry and enterprise, is exceedingly difficult.

Until the American Association was organized the progress of labor legislation was haphazard and at many points unintelligent. The Association endeavors to aid in directing this progress, so that it may accomplish a maximum of good with a minimum of harm.

Advocating labor laws, the Association at the same time empha-

sizes the importance of full knowledge of labor conditions and of the experience of other states and countries before such laws shall be passed. From the first it was recognized that the rigid and impartial enforcement of existing laws should precede the enactment of new regulations. Its work is thus at once progressive and constructive.

GENERAL PROGRAM

The following Program indicates in some detail the principal lines of activity which have been mapped out by the Association.

Industrial Hygiene and Occupational Diseases

Believing that many problems demanding labor legislation are fundamentally problems of health, the Association has placed great emphasis upon industrial hygiene.

The Association's activities in this field include the following:

October 1908—Organized National Commission on Industrial Hygiene.

March 1909—Published leaflet No. 1, on Industrial Hygiene.

April 1909—Began investigation of phosphorus poisoning.

May 1910—Report on Phosphorus poisoning, by the National Secretary, published by U. S. Bureau of Labor. (115 p.)

May 1910—Published pamphlet on Industrial Diseases and Occupational Standards. (9 p.)

June 1910—Introduced bill in Congress to prohibit use of poisonous phosphorus.

June 1910—Called First American Conference on Industrial Diseases.

July 1910—Published Proceedings of Conference on Industrial Diseases. Introductory Address (3 p.); Importance of Industrial Hygiene (2 p.); Phosphorus Poisoning in Manufacture of Matches (8 p.); Occupational Diseases in Illinois (8 p.); Lead Poisoning (13 p.); Problem and Extent of Industrial Diseases (18 p.)

November 1910—Published appeal for clinic and hospital for industrial diseases. (2 p.)

January 1911—Published leaflet No. 4, urging compulsory reporting of occupational diseases. (4 p.)

January 1911—Published, Lead Poisoning in Illinois (10 p.); Neurasthenia in Garment Workers (7 p.); Industrial Diseases in America (6 p.); Mercurial Poisoning in New York and New Jersey (5 p.); Medical Inspection of Factories (2 p.); and Memorial on Occupational Diseases (19 p.)

February 1911—Published leaflet No. 5 on "Phossy Jaw". (4 p.)

March 1911—Secured enactment of first American law for compulsory reporting of occupational diseases and followed it immediately by securing similar legislation in five additional states.

April 1911—Published pamphlet on Industrial Diseases and Physicians (7 p.)

June 1911—Published Analysis of Comfort and Health Laws for Factories (60 p.); Legal Protection from Injurious Dusts (7 p.); Ventilation—Air Space, Humidity and Temperature (4 p.); Factory Lighting (4 p.); Protection from Gases, Fumes and Vapors (2 p.)

July 1911—Published pamphlet on Diseases of Occupation (7 p.)

November 1911—Published pamphlet on Protection Against Occupational Diseases (6 p.)

December 1911—Published, The Beginning of Occupational Disease Reports (7 p.)

December 1911—Published, A Match Worker (1 p.)

December 1911—Report on Lead Poisoning in New York, by National Secretary, published by United States Bureau of Labor (23 p.)

December 1911—Published Standard Schedule for Occupational Disease Reports (2 p.)

February 1912—Published, Occupational Diseases in the Mining Industry (9 p.)

February 1912—Published leaflet No. 6, Phosphorus Poisoning (8 p.).

Industrial Accidents and Workmen's Compensation

The Association has from the beginning regarded the prevention of industrial accidents, and the enactment of a just plan of compensation for industrial injuries, as the most pressing immediate problem in labor legislation. Every session of the Association has placed great emphasis on this question.

The following reports and papers have been published and distributed:

"Workmen's Insurance in Illinois" (16 p.)

"The American Way of Distributing Accident Losses" (16 p.)

"What Form of Workingmen's Accident Insurance Should Our States Adopt?" (17 p.)

"Employers' Liability: A Criticism Based on Facts" (23 p.)

"Constitutionality of Workmen's Compensation Acts" (13 p.)

"Compulsory Compensation for Injured Workmen" (8 p.)

"Voluntary Indemnity for Injured Workmen" (6 p.)

"Problems and Progress of Workmen's Compensation in the United States" (17 p.)

"The Prevention of Accidents" (7 p.)

"Scientific Accident Prevention" (11 p.)

"Practical Safety Devices" (20 p.)

"Accident Reports in Minnesota" (8 p.)

"Advantages of Standard Accident Schedules" (6 p.)

"A Plan for Uniform Accident Reports" (9 p.)

"State Accident Insurance" (14 p.)

"Accident Compensation for Federal Employees" (14 p.)

"Constitutional Status of Workmen's Compensation" (16 p.)

With the conviction that careful investigation must precede greater uniformity in scientific legislation, the Association aided in bringing together an interstate Conference of the Members of the State Commissions on Workmen's Compensation. Four National Conferences have been held with very satisfactory results.

The Association hopes to aid in creating a still wider interest in the prevention of accidents, and has encouraged the foundation of State Museums of Safety Devices, particularly in Minnesota and Wisconsin, where a promising beginning has been made.

A special Committee on Workmen's Compensation has discouraged unfair discrimination against non-resident alien dependents.

During the last year, we have aided in the enactment of workmen's compensation or accident insurance laws in ten different states.

Our Chicago Conference, in Sept. 1911, resulted in the drafting by experts of a Standard Schedule for uniform accident reports in the different states.

Woman's Work

With the conviction that permanent industrial progress cannot be built upon the physical exhaustion of women, the Association is helping them to establish through legislation the maximum ten-hour working day. Our International Association has arranged treaties in Europe which prohibit the night work of women in fourteen countries, and plans to place other hour limitations upon the labor of women.

In America the enactment of careful laws, and their defense before the courts, require constant attention. In arousing public interest in opposition to the attacks upon the ten-hour law in Illinois, the Association sent a special letter to a thousand carefully selected people in that State. This letter was reprinted and distributed by Illinois organizations. The services of Honorable William James Calhoun now Minister to China, were secured in oral defense. The law was later upheld by the courts.

The Association has distributed thousands of copies of the "Illinois Ten-Hour Law," "Women Workers in Milwaukee Tanneries," "A Plea for Women Workers," "Constitutional Aspects of the Ten-Hour Law," and has prepared and published a comparative study of the laws which limit the working hours of women.

The Association has a special Committee on Woman's Work, the members of which are selected from the officers of the various organizations most actively interested in this problem. It is hoped that this Committee may lead to closer co-operation, less duplication, and greater effectiveness and economy of effort.

Unemployment

People in both public and private positions are looking to us for information and suggestions on the growing problem of unemployment. One session of our last Annual Meeting was devoted to

various aspects of this problem, with papers on: "The Coming Issue of Unemployment"; "The Experience of the National Employment Exchange"; and "Recent Advances in the Struggle Against Unemployment".

An American Section of the International Unemployment Association with Prof. Charles R. Henderson of Chicago University as Chairman has been formed as a Committee of our Association.

One Rest Day in Seven

The number of industries that are kept in continuous operation and the number of wage-earners who are regularly employed every day in the week have greatly increased in recent years.

At our last annual meeting the Association adopted a resolution favoring legislation for the purpose of insuring one rest day in seven to wage-earners in industrial employment.

A special committee, with John Fitch of the Pittsburg Survey as Chairman, is now drafting a proper form of bill, and our Association will co-operate with the Social Service Commission of the Federal Council of Churches in placing the facts before the public.

Enforcement of Labor Laws

The Association in all its work has never lost sight of the fact that the enforcement of the law is the supreme test.

From every industrial state comes the demand for help in developing a more efficient system of law enforcement. Co-operation in this important work has already called for the expenditure of much time in various states.

A comparative study of the administrative features of the laws of factory inspection was completed and published in 1909 under the title "Administration of Labor Laws" (16 pp.) Several additional studies dealing in part with the subject have since been published under the titles "Woman's Work"; "Child Labor"; "Industrial Education", and "Comfort, Health and Safety in Factories".

Recent articles include: "Scientific Standards in Labor Legislation" (12 p.); "Factory Inspection in Illinois" (21 p.); "The Massachusetts Board of Boiler Rules" (11 p.); and "The Wisconsin Industrial Commission" (9 p.)

A special Committee on this subject has recently been appointed with John Calder, General Manager of the Remington Typewriter Works, as Chairman.

Publications

Our Bulletin of the International Labor Office is published quarterly, and contains a complete survey of the progress of labor legislation in all countries.

Our Monthly Department on Labor Legislation in the Survey magazine calls attention to important Conferences, news notes, helpful publications, etc.

Our American Labor Legislation Review establishes quarterly means for dissemination among members, of carefully prepared reports and articles. Vol. 1, No. 1, Proceedings Annual Meeting, (143 p.) ; Vol. 1, No. 2, Comfort, Health and Safety (134 p.) ; Vol. 1, No. 3, Review of Labor Legislation, 1911 (162 p.) ; Vol. 1, No. 4, Prevention and Reporting of Industrial Injuries (142 p.)

The Annual Review of Labor Legislation is issued each year immediately after the legislatures adjourn. It furnishes the facts in convenient form at the time they are most needed.

Special summaries of labor laws have been issued on such topics as: "Child Labor", "Woman's Work", "Industrial Education", "Industrial Accidents and Diseases", and "Administration of Factory Inspection Laws".

Educational Bureau and Clearing House for Information

The Association aims to make public through newspapers and magazines trustworthy and vital reports on industrial relations which call for adjustment through legislation.

Through a thoroughly equipped educational bureau, the Association could so direct the progress of desirable labor legislation as to save at least ten years in the forward movement of the next quarter of a century. The independent equipment of such a bureau would be a very expensive undertaking. But as an intimate part of this Association equal returns could be secured for a much smaller amount.

An important and far-reaching function of the Association has been to serve as a Clearing House for information on labor legislation. As one of sixteen national sections of the International Association for Labor Legislation, this Association has exceptional facilities for such work. Requests for information come to the office every day from State Commissions, Universities, Trade Unions, Chambers of Commerce, manufacturers, legislators, librarians, and others. It is necessary to have on file complete, up-to-date information, all carefully classified.

Public Meetings

Meetings are held as occasion demands to discuss immediate problems and develop plans.

In December of each year the Association holds its Annual Meeting, two sessions of which are held jointly with the American Economic, the Political Science, or the Statistical Association. There is held, usually in Chicago, a special mid-year meeting of the General Administrative Council.

The Association has also arranged details of meetings of the National Conference on Industrial Accidents.

The first Biennial Congress on Industrial Diseases was called by our Association in June 1910, and the second is to occur in June, 1912.

I. IMMEDIATE PROGRAM FOR 1912.

1. Secure the passage by Congress of the Esch Phosphorus Bill.
2. Extend the uniform reporting of occupational diseases to additional states.
3. Secure the adoption of our standard industrial accident and disease schedules.
4. Provide that one day's rest in seven be granted, no matter how continuous the industry.
5. Co-operate in establishing through legislation the maximum 10-hour working day for women.
6. Aid in the enactment of additional laws insuring just systems of compensation or insurance.
7. Hold the Second National Conference on Industrial Diseases.
8. Prepare for the supreme test of law enforcement by helping to develop more efficient machinery for administration in the different states.

II. OUR MEMBERS AND SUBSCRIBERS WILL RECEIVE:

1. The American Labor Legislation Review (Quarterly).
2. Invitations to Association Meetings.
3. Special legislative announcements and reports.
4. Notification of legislative activities needing and deserving active support.
5. Free use of the Bureau of Information.
6. Organized co-operation in securing the enactment and enforcement of wise labor laws.

Our Association is entirely dependent upon membership fees and voluntary contributions for the continuance of its activities. It affords that two-fold opportunity which thoughtful Americans desire: (1) A chance to know what is actually being done toward establishing fair standards of health and safety for industrial work-

ers; (2) A chance to *do something*—to act wisely and effectively at times when personal influence will count and when organized expression is needed. Those who appreciate the importance of the above program are invited to co-operate in the work and to contribute liberally to its support.

Checks may be made payable to V. Everit Macy, Treasurer, and mailed to American Association for Labor Legislation, Metropolitan Tower, New York City.

CONSTITUTION
OF THE
AMERICAN ASSOCIATION FOR LABOR LEGISLATION

ADOPTED FEB. 15, 1906

Amended Dec. 30, 1907; Dec. 30, 1908; Dec. 29, 1909; Dec. 29, 1910.

ARTICLE I. NAME.

This Society shall be known as the American Association for Labor Legislation.

ARTICLE II. OBJECTS.

The objects of this Association shall be:

1. To serve as the American branch of the International Association for Labor Legislation, the aims of which are stated in the appended Article of its Statutes.
2. To promote uniformity of labor legislation in the United States.
3. To encourage the study of labor conditions in the United States with a view to promoting desirable labor legislation.

ARTICLE III. MEMBERSHIP.

Members of the Association shall be elected by the Executive Committee. Eligible to membership are individuals, societies and institutions that adhere to its objects and pay the necessary subscriptions. The minimum annual fee for individuals shall be three dollars, or five dollars if the member wishes to receive the Bulletin of the International Association. In states in which there is a State Association \$1 of the dues shall be paid over to the State Association. The minimum annual fee for societies and institutions shall be five dollars, and they shall receive one copy of the Bulletin, and for each two-dollar subscription an additional copy.

ARTICLE IV. OFFICERS.

The officers of the Association shall be a president, ten vice-presidents, a secretary and a treasurer. There shall also be a General Administrative Council consisting of the officers and not less than twenty-five or more than one hundred other persons. The General Administrative Council shall have power to fill vacancies in its own ranks and in the list of officers; to appoint an Executive Committee from among its own members, and such other committees as it shall deem wise; to frame by-laws not inconsistent with this constitution; to choose the delegates of the Association to the Committee of the International Association; to conduct the business and direct the expenditures of the Association. It shall meet at least twice a year. Eight members shall constitute a quorum.

ARTICLE V. LOCAL SECTIONS.

Local Sections of this Association may be constituted in any state upon

certification by the secretary and the Executive Committee. They shall, until changed by section seven, be governed by the following by-laws:

SEC. 1. The name of this organization is the [Name of State] Association for Labor Legislation.

SEC. 2. Eligible to membership are members of the American Association for Labor Legislation residing in———. Members of the American Association for Labor Legislation become members of this Association by vote of the Executive Committee of this Association.

SEC. 3. The purpose of this Association is to promote the work of the American Association for Labor Legislation in general, also in special relation to the needs of the state of ———.

SEC. 4. The Officers of this Association shall be a president, a vice-president, a secretary, and a treasurer, who, with three or more other members, shall constitute the Executive Committee.

SEC. 5. The Executive Committee shall administer the affairs of the Association and report at annual or called meetings of members of the Association. It shall be the duty of the Executive Committee to arrange programs for discussion of members, to institute and direct investigations, to take measures to increase the membership of the American Association for Labor Legislation, to promote publicity of the policies and recommendations of the American Association for Labor Legislation by publications and meetings.

SEC. 6. An annual meeting of the section for election of officers and for other business shall be held in October or November of each year.

SEC. 7. These by-laws may be amended at any annual or called meeting of the Association, notice of the proposed amendment having been sent to each member at least one month in advance.

ARTICLE VI. MEETINGS.

The Annual meeting and other general meetings of members shall be called by the General Administrative Council and notice thereof shall be sent to members at least three weeks in advance. Societies and institutions shall be represented by two delegates each. The annual meeting shall elect the officers and other members of the General Administrative Council.

Meetings of the General Administrative Council shall be called by the Executive Committee. Notice of such meetings shall be sent to members of the Council at least three weeks in advance.

Amendments to the constitution, after receiving the approval of the General Administrative Council, may be adopted at any general meeting. Fifteen members shall constitute a quorum.

ARTICLE II OF THE STATUTES OF THE INTERNATIONAL ASSOCIATION DEFINING THE AIMS OF THE ASSOCIATION.

1. To serve as a bond of union to those who, in the different industrial countries believe in the necessity of protective labor legislation.

2. To organize an International Labor Office, the mission of which will be to publish in French, German and English a periodical collection of labor

Constitution

laws in all countries, or to lend its support to a publication of that kind. This collection will contain :

- (A) The text or the contents of all laws, regulations and ordinances in force relating to the protection of workingmen in general, and notably to the labor of children and women, to the limitation of the hours of labor of male and adult workingmen, to Sunday rest, to periodic pauses, to the dangerous trades;
 - (B) An historical exposition relating to these laws and regulations;
 - (C) The gist of reports and official documents concerning the interpretation and execution of these laws and ordinances.
3. To facilitate the study of labor legislation in different countries, and, in particular, to furnish to the members of the Association information on the laws in force, and on their application in different states.
 4. To promote, by the preparation of memoranda or otherwise, the study of the question how an agreement of the different labor codes, and by which methods international statistics of labor may be secured.
 5. To call meetings of international congresses of labor legislation.

BY-LAWS

1. *Committees.* The Council shall elect an Executive Committee, as well as Committees on Finance, Legislation, and Publicity, and such other committees as occasion may require.

2. *Powers of the Executive Committee.* The Executive Committee shall exercise, subject to the General Administrative Council, the powers of the Council in the intervals between its sessions.

3. *International Obligations.* The Executive Committee shall choose the members of Committees and Commissions and the reporters required by votes of the International Association.

PUBLICATIONS

American Association for Labor Legislation

- No. 1: Proceedings of the First Annual Meeting, 1907.
- No. 2: Proceedings of the Second Annual Meeting, 1908.
- No. 3: Report of the General Administrative Council, 1909.
- No. 4: (Legislative Review No. 1) Review of Labor Legislation of 1909.
- No. 5: (Legislative Review No. 2) Industrial Education, 1909.
- No. 6: (Legislative Review No. 3) Administration of Labor Laws, 1909.
- No. 7: (Legislative Review No. 4) Woman's Work, 1909.
- No. 8: (Legislative Review No. 5) Child Labor, 1910.
- No. 9: Proceedings of the Third Annual Meeting, 1909.
 Labor Legislation and Economic Progress, Henry W. Farnam.
 Judicial Limitations and Labor Legislation, Ernst Freund.
 Problems of Labor Legislation Under Our Federal Constitution, Frederick N. Judson.
 Precedent versus Conditions in Court Interpretation of Labor Legislation, George G. Groat.
 Constitutionality of Workmen's Compensation Acts, H. V. Mercer.
- No. 10: Proceedings of the First National Conference on Industrial Diseases.
- No. 11: (Legislative Review No. 6) Review of Labor Legislation of 1910.
- No. 12: (American Labor Legislation Review, Vol. I, No. 1.) Proceedings of the Fourth Annual Meeting, 1910.
 Discussion of Immediate Problems:
 Industrial Hygiene.
 Limitation of Working Hours of Women.
 Enforcement of Labor Laws.
 Lead Poisoning in Illinois, Alice Hamilton.
 Neurasthenia in Garment Workers, Sidney I. Schwab.
 Industrial Diseases in America, Frederick L. Hoffman.
 Compulsory Compensation for Injured Workmen, D. L. Cease.
 Voluntary Indemnity for Injured Workmen, F. C. Schwedtmann.
 Problems and Progress of Workmen's Compensation in the United States, Thomas I. Parkinson.
 Memorial on Occupational Diseases.
- No. 13: (American Labor Legislation Review, Vol. I, No. 2) Comfort, Health and Safety in Factories:
 Comparative Analysis of Existing Laws. Prepared by Maud Swett and Ruth White under the direction of John R. Commons.
 Topical Criticism of Existing Laws:
 The Prevention of Accidents, Leonard W. Hatch.
 Legal Protection from Injurious Dusts, Frederick L. Hoffman.
 Ventilation—Air Space, Humidity and Temperature, C. E. A. Winslow.
 Factory Lighting, E. Leavenworth Elliott.
 Protection from Gases, Fumes and Vapors, C. T. Graham-Rogers.
 Scientific Standards in Labor Legislation, John and Irene Andrews.
- No. 14: (American Labor Legislation Review, Vol. I, No. 3.) Review of Labor Legislation of 1911.
- No. 15: (American Labor Legislation Review, Vol. I, No. 4.) Prevention and Reporting of Industrial Injuries.
 Scientific Accident Prevention, John Calder.
 Practical Safety Devices, Robert J. Young.
 The Wisconsin Industrial Commission, John R. Commons.
 Safety Inspection in Illinois, Edgar T. Davies.
 The Massachusetts Board of Boiler Rules, Joseph H. McNeill.
 The Beginning of Occupational Disease Reports, John B. Andrews.
 Accident Reports in Minnesota, Don D. Lescossier.
 Advantages of Standard Accident Schedules, Edson S. Lott.
 A Plan for Uniform Accident Reports, Leonard W. Hatch.
- No. 16: (American Labor Legislation Review, Vol. II, No. 1.) Proceedings of the Fifth Annual Meeting, 1911.

*The law is the
last result of human
wisdom acting upon
human experience
for the benefit of
the public.*

Samuel Johnson.

Sec 1665.4

The fundamental purpose of labor legislation is the conservation of the human resources of the nation.

AMERICAN LABOR LEGISLATION
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Symposium on Diseases of Occupation.

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JUNE, 1912

PROCEEDINGS OF THE SECOND NATIONAL CONFERENCE ON INDUSTRIAL DISEASES
ATLANTIC CITY, N. J., JUNE 3-5, 1912

American Association for Labor Legislation
Joint Session with American Medical Association

AMERICAN ASSOCIATION FOR LABOR LEGISLATION
131 EAST 23d ST., NEW YORK CITY

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Facilitates the study of Labor Legislation in all countries and provides information on the subject.

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AMERICAN LABOR LEGISLATION REVIEW
Vol. II, No. 2

ILLUSTRATIONS

Dry Sandpapering. Wet Sanding with Pumice Stone.	Facing Page	181
Arsenic Poisoning	" "	188
Cross Section of Caisson in Full Operation	" "	198
Occupational Skin Diseases	" "	208
Making Lead Colors. Lead Casting, Showing Lead Pot in a Smelter	" "	278
Dust Collectors in a Lead Plant. Emptying a Red-Lead Furnace	" "	277
Lead Used as a Hardening Agent. Heading up Barrels of Dry Red Lead	" "	284
Chaser Room in White-Lead Factory	" "	288
Air-Lock on Top of Caisson	" "	358
Separating Screens in White-Lead Factory	" "	360
Workers in White-Lead Factory	" "	368

AMERICAN LABOR LEGISLATION REVIEW

Vol. II

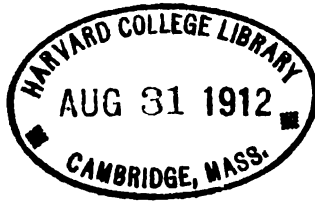
JUNE, 1912

No. 2

CONTENTS

I. SYMPOSIUM ON INDUSTRIAL DISEASES.		PAGE
Classification of Occupational Diseases.....	W. G. THOMPSON...	185
Compressed-Air Illness.....	FREDERICK L. KEAYS	192
Occupational Skin Diseases.....	JOHN A. FORDYCE..	206
Occupational Nervous and Mental Diseases..	CHARLES L. DANA..	217
Occupational Eye Diseases.....	ELlice M. ALGER..	223
Industrial Poisoning.....	DAVID L. EDSELL...	231
Cooperation in Promoting Industrial Hygiene	HENRY R. SEAGER...	235
GENERAL DISCUSSION		242
II. INVESTIGATION OF INDUSTRIAL DISEASES.		
Intensive Investigations in Industrial Hygiene		
	F. L. HOFFMAN....	255
Compulsory Reporting by Physicians	LEONARD W. HATCH	264
Lead Poisoning in New York City.....	EDWARD E. PRATT..	273
GENERAL DISCUSSION		281
III. HEALTH PROBLEMS IN MODERN INDUSTRY.		
The Function of Hospitals and Clinics in the Prevention of Industrial Disease.....		
	RICHARD CABOT.....	293
Temperature and Humidity in Factories....	C.-E. A. WINSLOW..	297
Air Impurities—Dusts, Fumes, and Gases...	CHARLES BASKERVILLE	305
Effects of Confined Air Upon the Health of Workers	GEORGE M. PRICE....	312
GENERAL DISCUSSION		317
IV. STATE PROMOTION OF INDUSTRIAL HYGIENE.		
Education for the Prevention of Industrial Diseases		
	M. G. OVERLOCK....	329
Notification of Occupational Diseases.....	CRESSY L. WILBUR..	339
Medical Inspection of Factories in Illinois..	HAROLD K. GIBSON..	346
Compressed-Air Illness in Caisson Work....	L. M. RYAN.....	350
Legal Protection for Workers in Unhealthful Trades	JOHN B. ANDREWS..	356
GENERAL DISCUSSION		363
V. BIBLIOGRAPHY ON INDUSTRIAL HYGIENE.		
American Titles		369
Titles Other Than American		397

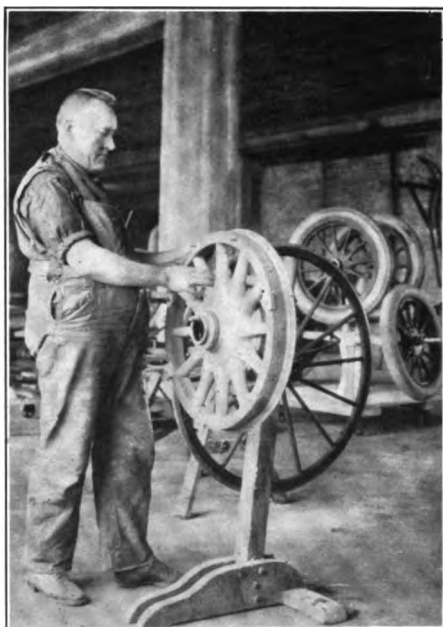
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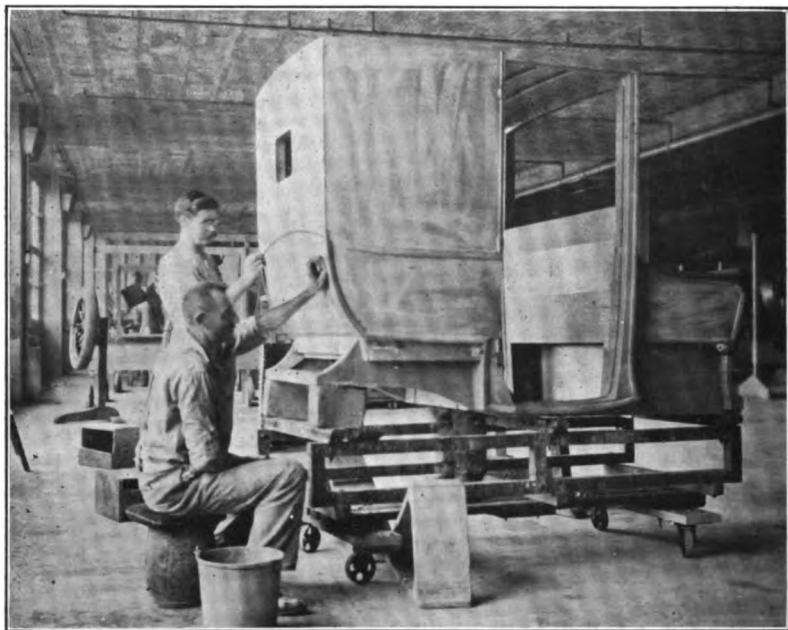
Princeton University Press
Princeton, N. J.





DRY SANDPAPERING

DRY SANDING OF PAINT IS A FREQUENT CAUSE OF LEAD POISONING. THE OPERATION FILLS THE AIR WITH TINY PARTICLES OF LEAD DUST



WET SANDING WITH PUMICE STONE

DUST IS AVOIDED WHEN SANDING IS DONE WITH WET PUMICE STONE

INTRODUCTION

When the American Association for Labor Legislation called the First National Conference on Industrial Diseases, in Chicago in June, 1910, it was possible only to mention the appointment of the first state commission on occupational diseases and to note the completion of an investigation of one industrial poison. That practically marked the extent of serious public interest in diseases of occupation, and the first conference attracted attention to this as to a new problem. Since then there has been a remarkable development of interest in the subject.

The Memorial on Occupational Diseases, prepared by a committee of the first conference, laid the foundation for and strongly urged national investigation of industrial hygiene. One after another eight states have since then passed the Association for Labor Legislation's standard bill requiring physicians to report all cases of certain diseases of occupation. The work of the one state commission, in Illinois, led to the enactment of a special occupational disease law requiring monthly medical examinations of workmen in a few of the most hazardous employments. In April, 1912, the United States Congress agreed, by passing the Association's bill placing a prohibitive tax on poisonous phosphorus matches, to abolish "phossy jaw", the occupational disease due to the one industrial poison which had then been thoroughly studied. In the meantime, the List of Industrial Poisons, prepared by the International Association for Labor Legislation and translated by the United States Bureau of Labor, gave definite direction to further investigations. Reports on industrial poisoning from lead and mercury have already been published, and medical inspection of factories has increased in importance.

The Second National Conference on Industrial Diseases, in Atlantic City, June, 1912, was attended by practicing physicians, state and federal public health officials, medical inspectors of factories, physiologists, investigators and statisticians, manufacturers, efficiency engineers, insurance experts, labor leaders, economists, and social workers. Through an industrial hygiene exhibit, the first extensive display of the kind in America, in-

dustrial processes dangerous to health and the effects of these peculiar work hazards, including such diseases as "phossy jaw", lead poisoning, arsenic poisoning, compressed-air illness and numerous occupational eye and skin diseases, were graphically placed before the audience. These photographs, charts, and drawings were realistically and effectively supplemented by stereopticon illustrations, made by the new process in color photography. Finally, through the medium of a joint session with the American Medical Association, that organization, for the first time in the sixty-six years of its existence, gave a place to the industrial disease problem on its annual program.

There is now scarcely a public meeting of importance for the discussion of any phase of the labor problem that does not include at least some mention of occupational diseases. Three federal bureaus are now making investigations in their own respective fields, and several state commissions, bureaus of factory inspection, and boards of health are at work upon the problem. The American Association for Labor Legislation has now published and distributed no less than forty papers and reports on occupational diseases and industrial hygiene. The publication at this time, through the cooperation of the Association for Labor Legislation, the Library of Congress, and the United States Bureau of Labor, of a special Bibliography on Industrial Hygiene, will make further researches less difficult.

The proceedings of the Second National Conference on Industrial Diseases, here made available in permanent form, should give a new impetus to the nation-wide campaign for the promotion of industrial hygiene. The members of the Association for Labor Legislation may well feel that by intelligent cooperation along definite lines they have made a promising beginning in the important work of conserving the health and lives of industrial workers.

JOHN B. ANDREWS, Secretary,
American Association for Labor Legislation.

I

SYMPOSIUM ON INDUSTRIAL DISEASES

JOINT SESSION WITH THE AMERICAN MEDICAL ASSOCIATION

Presiding Officer: RUPERT BLUE
Surgeon General, United States Public Health
and Marine Hospital Service
WASHINGTON, D. C.

CLASSIFICATION OF OCCUPATIONAL DISEASES

W. GILMAN THOMPSON
Cornell University Medical College.

In order to establish a satisfactory classification of the occupational diseases and the industrial hazards which give origin to them, it is necessary to agree upon a standard nomenclature which may prove not only of scientific value, but constitute a working basis for such remedial legislation as may prove desirable. The authority for such nomenclature and classification is properly vested in the United States Bureau of the Census which, being a national institution, is better fitted for this work than the local municipal or state boards of health or labor bureaus. Agreement as to uniformity among the latter would obviously involve much time and discussion, with probably less satisfactory ultimate results.

The Bureau of the Census already furnishes a generally accepted classification of the causes of death from ordinary diseases and includes a number of causes of death from occupational diseases, about one hundred of which are enumerated in the Mortality Statistics Bulletin No. 108, 1909, p. 33. But this list is obviously merely tentative, else why should the making of neckties be included as hazardous and the caisson disease be omitted, of which, in the admirable report of Dr. F. L. Keays, twenty fatal cases are recorded as occurring within a few years in New York City alone? Fortunately, the Bureau of the Census is at present cooperating with the Committee of the American Medical Association on the Nomenclature and Classification of Diseases, and it is to be hoped that they will find time to include in this work the formulation of a complete classification of the disease hazards and deleterious substances which are causatively related to the industrial diseases,—irrespective of mortality statistics. As far as these diseases are themselves concerned, they are fairly well named and classified already, but not in connection with their causation. For example, arteriosclerosis or chronic nephritis due to chronic lead poisoning do not differ materially from the same diseases originating from

syphilis, chronic alcoholism, gout and other etiological factors. Nor does a bronchitis due to inhaling dust in a cotton mill differ essentially from that acquired in other ways. In fact, apart from the lesions of the caisson disease, and a few of the bone lesions, occupational tics and palsies, there is little that is new in those of the diseases of hazardous industries, and little which cannot be included in existing medical nomenclature as applied to disease in general.

A. HARMFUL SUBSTANCES

The injurious substances employed, however, present a somewhat more complex problem, mainly because their number is rapidly increasing, and any system of classification should be an elastic one, permitting of extension and providing for a large miscellaneous group. For example, the great majority of injurious substances may be comprised under the six general headings: (1) Metal poisons, including the metallic salts; (2) toxic gases, vapors and fumes; (3) toxic fluids (such as acids and alkalis, petroleum products, etc.); (4) toxic or irritant dusts, subdivided into: (a) insoluble inorganic dusts (irritating the respiratory passages), (b) soluble inorganic dusts (liable to be swallowed and absorbed), (c) organic dusts and fibers; (5) organic germs (such as those of glanders and anthrax); and (6) miscellaneous irritants.

Under these major headings may be grouped practically all of the irritant substances, yet certain difficulties arise even in this elementary arrangement. For example, lead, which of course would be classed as a simple metal poison, is also, when heated, to be ranked among the toxic fumes, and again, in the form of filings, as a soluble inorganic dust. As this applies to many of the other metals, to repeat them all under each subheading would be cumbersome. Phosphorus, for instance, is a metal, yet it is as a toxic fume that it works such havoc, and it had better be classed with the latter.

Furthermore, the names of many substances may convey no intimation of their special hazards. For example, whether ferrosilicon be classed among the metals as containing iron and traces of arsenic, or as a liquid, since by itself it is non-toxic, neither of these groups would suggest its real hazard, which consists in the accidental access of water, producing the combination arseniuretted hydrogen gas that has cost many lives, especially on ships in which the ferrosilicon was being transported.

For such reasons, it would seem best to class each substance primarily in the major group which its most common form and use suggest, and, when its common name conveys no idea of the hazard, to indicate the latter in parenthesis. Thus ferrosilicon would be grouped under toxic liquids, and a parenthesis should follow, reading "(arseniuretted hydrogen gas, on hydration)".

B. HARMFUL CONDITIONS OF PHYSICAL ENVIRONMENT

The above general classification refers only to the material hazards, so to speak, and does not provide for the injuries arising from environmental or physical conditions, such as the air compression affecting tunnel and caisson workers and divers, the rarefied air affecting aviators, or the tunnel injuries to the ears. Nor does it provide for the injuries arising from excessive temperature changes as affecting smelter employees, stokers, workers in cold-storage, etc. A group, therefore, of hazardous occupations due to physical environment should be established, including hazards from excessive variations in (a) air pressure, (b) humidity, (c) air temperature, and (d) light (including electric light, the X-ray, etc.).

C. INJURIES (MEDICAL) TO NERVES, MUSCLES, AND BONES

Another general group of occupational hazards is necessary to comprise disease injuries to nerves, muscles, and bones, arising from such conditions as occupational strain, fatigue, repeated blows and vibrations, excessive pressure, repeated muscular contractions, and faulty positions assumed in working at benches, handling many forms of tools, etc. The large group of "occupational neuroses", with cramps, palsy, tremors, tics, neuralgia, neuritis, and vaso-motor disorders, should be included as subdivisions of this group. To this also may be added a subclass comprising insomnia, headache, general nervousness as from "speeding up", etc.

D. INJURIES OF SPECIAL ORGANS

Other primary groups of occupational diseases should include injuries of special organs: namely, (1) injuries to the skin; (2) injuries to the eyes; (3) injuries to the ears; and (4) injuries to the nose and throat.

Under the foregoing general classification, with appropriate subdivisions, may be included all the specific causes of occupational diseases, namely, the (a) material, (b) chemical, (c) physical, and (d) physiological causes.

CLASSIFICATION OF HAZARDOUS OCCUPATIONS

There remains to be dealt with the classification of hazardous occupations, which is, from every point of view, a far more difficult task. While it is true that some few definite occupations, like that of the caisson and tunnel workers, each produce a single definite disease from a single definite cause, very many industries are so complex as to give rise to many different hazards and as many different diseases. A classification which fails to make this clear fails of its primary object, and is not alone useless but may prove unfair as a basis for remedial legislation or scientific deductions. But to specify all the subdivisions of labor in a complex industry is to accumulate a catalogue of many thousands of technical terms and easily to become lost in a maze of phraseology. It is precisely in this understanding of technical work that physicians as a body need education, for upon them must devolve the collection of disease data, if such data are to be confirmed by accurate diagnoses. It is not customary, as yet, to give systematic instruction in medical colleges upon occupational diseases. Most of the standard textbooks on medicine refer to scarcely a half dozen of the industrial poisons, such as lead or arsenic, and the literature of this topic adapted for use in this country is scattered mainly in isolated monographs and a few brief journal articles.

One or two illustrations will serve to emphasize the difficulties of properly classifying the occupations involving disease hazards. If a workman be classed merely as a "potter" he may be employed in glazing or polishing and acquire lead poisoning; or, as in the Limoge works in France, he may be a grinder subject to inhalation of silica dust, and may acquire fibroid phthisis and subsequently tuberculosis; or as a molder he may be exposed to constant humidity and may suffer from rheumatism or chronic bronchitis. Obviously, to class him solely as a potter supplies information so incomplete as to be almost useless. Other terms are still more ambiguous. For example, a "hatter" may be engaged in the non-hazardous occupation of selling hats, may be a maker of straw hats, associated either with no hazard or with the minor one of using some bleaching substance or inhaling straw dust, or may be a man who is employed in making felt hats. This latter industry is so subdivided that the man may rank as a blocker, blower, pouncer, flanger, curler, shearer, stiffener, singer, trimmer, coner, dyer, dryer, feeder, hardener, mixer, welter, or



1.



2.

ARSENIC POISONING

1. PUTTING PARIS GREEN INTO A BOLTER. AN OLD AND DANGEROUS METHOD
2. A COMPARATIVELY DUSTLESS BOLTER. RESPIRATORS WORN AS AN ADDITIONAL PROTECTION

finisher. In about half of these labors he would be subject to no hazard whatever, as for instance if he be a curler or finisher; but if he be a fur-cutter, "maker" or sizer he is very susceptible to bronchial irritation and liable to add to the tuberculosis mortality. If, on the other hand, he be a pouncer he is almost certain to acquire chronic mercurial poisoning and sooner or later to become wholly incapacitated for work, and he may possibly die as a result of his labor.

In confirmation of the lack of information among manufacturers, or of their much worse willful neglect of the humanitarian interest which they ought to exercise, is the common observation of all who have made special investigations in lead poisoning that the manufacturers almost universally profess ignorance as to its existence, at least in their own establishments. Yet in New York State, Dr. John B. Andrews has compiled data of sixty cases of death from this cause occurring within the two years 1909 and 1910, and I have personally collected data from only two hospitals and one dispensary in New York City of over three hundred cases of lead poisoning so serious as to demand hospital treatment, and sometimes to produce permanent disability.

Before a standard classification of occupational diseases is adopted, attention should be given to the educational needs of the situation. A classification which is too elaborate may fail of its chief purpose, which is to interest physicians in this important humanitarian, scientific, and legislative work, i. e. the control and mitigation of the occupational disease hazards. It is desirable, therefore, to furnish physicians and employers with a simple general classification, after the form outlined in this article, and to supplement it with a more elaborate classification to be supplied to special investigators in hospitals and dispensaries, or to those who have access to the study of large groups of cases. It is clearly undesirable that hasty or unfair legislation, based on insufficient data, should be enacted, and it is therefore of the greatest importance that physicians everywhere enter into hearty cooperation with the state authorities in the collection of accurate statistics which shall be of true scientific value.

A beginning has been made in eight states by the enactment of laws requiring physicians to report six of the occupational diseases, namely, those due to four metals, lead, arsenic, mercury, and phos-

phorus, to one germ, the anthrax bacillus, and the caisson disease. This list will doubtless be extended considerably in the near future, and among the first additions should be wood-alcohol poisoning. This substance is used to dissolve the shellac for varnish which is often applied in confined spaces, such as the linings of brewery vats, where the alcohol fumes accumulate. There were two deaths and a case of permanent blindness from this cause in Buffalo recently, and three other deaths, the last one of which was diagnosed by the physician who was summoned as a case of "epilepsy", occurred in a brewer's vat in New York.

As an aid to meet the educational requirements of classification in New York State, I have furnished the state labor bureau with a brief general classification of occupational hazards and harmful substances, which is printed on the backs of the notification blanks required by law to be sent to each physician. I also furnished a more elaborate classification which is printed in small booklet form and is designed for distribution to hospitals and dispensaries, social service workers, and all physicians who will take interest enough to gather special data. As far as possible this classification is arranged in four parallel columns, headed respectively "Industry", "Harmful Substance", "Mode of Entrance", "Symptoms and Diagnosis."

For my own use and that of my assistants in hospital and dispensary work, I have designed history cards with headings calling for classified data, one set for the metal poisons, another for the dust and fiber irritants, etc. From such uniformly classified cards it is easy to compile scientific data for any particular group of diseases.

CONCLUSION

In conclusion, I would recommend (1) that the Bureau of the Census establish a uniform nomenclature and classification as complete as possible, to be used as a national standard; and (2) that the state labor bureaus or health boards issue a standard notification blank like the one in use in New York State, which is modeled after the national death certificate blank of the Bureau of the Census. On the back of this blank should be printed a brief working classification of the commoner occupational hazards and harmful substances, emphasizing in black letters the most important ones. And I would also recommend (3) that there should similarly be issued to all who will make use of it, a more comprehensive classification in booklet

form, detailing the symptoms in parallel columns with the injurious substances liable to produce them.

GENERAL CLASSIFICATION OF OCCUPATIONAL DISEASES
AND HARMFUL SUBSTANCES

A. *Harmful Substances:*

1. Metallic poisons.
2. Toxic gases, vapors, and fumes.
3. Toxic fluids (acids, alkalies, dyes, etc.).
4. Irritant dusts and fibers.
 - (a) Insoluble inorganic dusts.
 - (b) Soluble inorganic dusts.
 - (c) Organic dusts and fibers.
5. Organic germs (anthrax, glanders, etc.).
6. Miscellaneous irritants.

B. *Harmful Conditions of Environment:*

1. Air compression and rarefaction.
2. Excessive humidity.
3. Extreme heat and cold.
4. Excessive light (electric, X-ray, etc.).

C. *Occupational Injuries:*

(Medical)

1. Injuries to nerves, muscles and bones.
(Strain, fatigue, cramp, faulty positions, "occupational neuroses", blows, vibrations, pressure, etc.)
2. Injuries to the eyes.
3. Injuries to the ears.
4. Injuries to the nose and throat.
5. Injuries to the skin.

OCCUPATIONAL DISEASES OF THE

1. Blood.
2. Circulatory system.
3. Respiratory system.
4. Nervous system.
5. Digestive system.
6. Muscular system.
7. Cutaneous system.
8. Urinary system.
9. Special sense organs.

COMPRESSED-AIR ILLNESS

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This paper is based largely upon a report, made by the writer in 1909¹, of 3692 cases of compressed-air illness which resulted at the Pennsylvania East River Tunnels during the time that he was medical director. It will present a brief general description of the subject of compressed-air illness, special attention being paid to its cause and to its prevention.

Triger,² a French engineer, who designed the first practical caisson in 1839, mentioned the occurrence of pains in the extremities of workmen employed. In 1868, Le Roy de Méricourt³ published the first medical report of illness among sponge-divers. Since Triger's report many contributions have been made to the subject of compressed-air illness. A full review of the literature of the subject may be found in *Caisson Sickness* by Leonard Hill, a book published this year.

ETIOLOGY—CAUSES

Various theories have been advanced to explain the symptoms occurring among compressed-air workers. The earliest theory to receive general recognition was that advocated by Pol and Wattelle⁴ in 1854, the so-called mechanical-congestion theory. In 1878 Paul Bert⁵ proposed the theory, supporting it by logical reasoning and by experiments, which is now universally accepted. It is

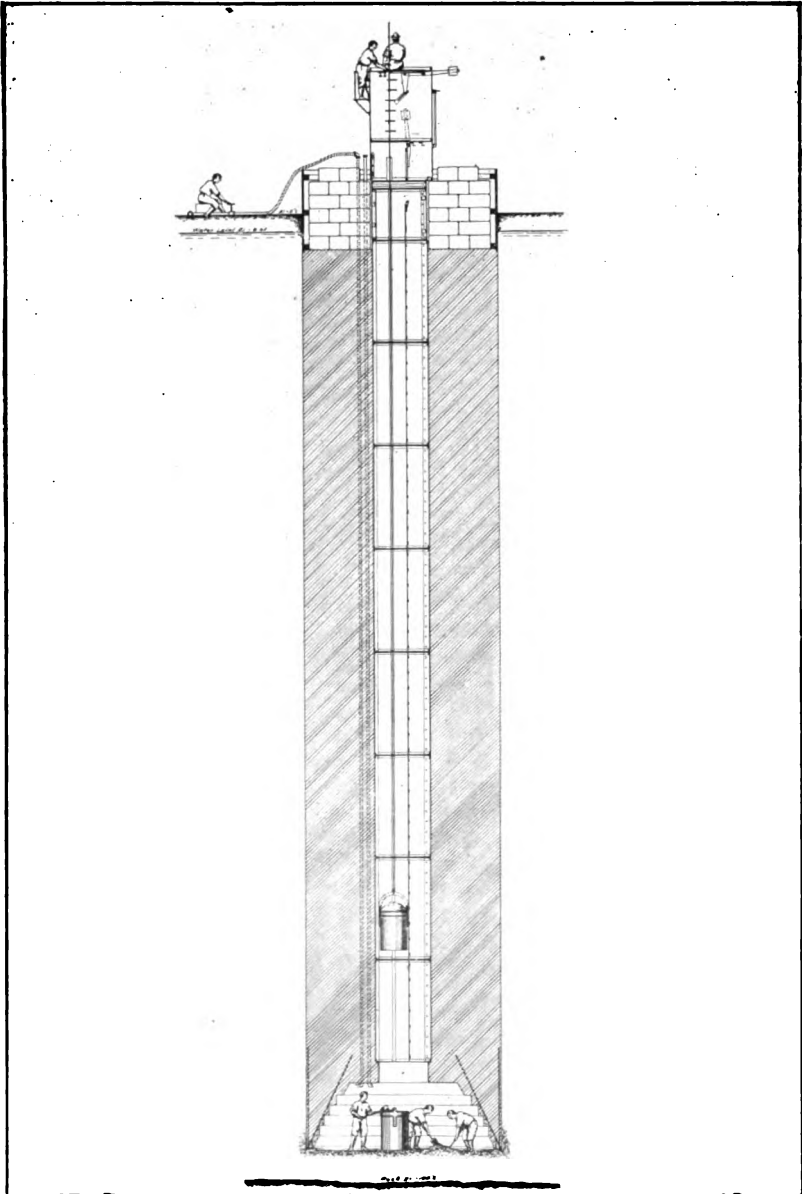
¹ Keays, "Compressed-Air Illness, With a Report of 3692 Cases," *Researches from the Department of Medicine, Publications of Cornell University Medical College*, Vol. II, pp. 1-55.

² Triger, "Compte rendu," *Acad. des Sciences*, 1841, tome XIII, p. 884

³ De Méricourt, *Bull. de l'Académie de Méd.*, 1868, XXXIII. *Ann. d'Hygiène Publ. et de Méd. Légale*, 1869, second series, XXXI.

⁴ Pol and Wattelle, "Mémoire sur les Effets de la Compression de l'Air." *Annal. d'Hyg. Publique et de Méd. Légale*. Paris, 1854.

⁵ Bert, *La Pression Barométrique*. Paris, 1878.



CROSS SECTION OF CAISSON IN FULL OPERATION
 WORKERS ("SAND HOGS") AT BOTTOM OF CAISSON WORK UNDER ATMOSPHERIC
 PRESSURE SUFFICIENT TO PREVENT WATER FROM FLOWING
 IN AS SAND IS SHOVELLED UP

TOO RAPID DECOMPRESSION, AS IN GOING SUDDENLY OUT INTO THE NORMAL
 ATMOSPHERE, CAUSES COMPRESSED-AIR ILLNESS

a surprising fact that Bert's explanation was practically disregarded for several years, while the mechanical-congestion theory continued to be accepted, especially by the early American writers.

Briefly stated, Bert's theory is as follows: The blood of a man or of an animal, when in compressed air, takes into solution an increased quantity of oxygen and nitrogen from the air, the quantity of the gases absorbed being in direct proportion to the increase of pressure. The gases taken up by the blood are gradually distributed to the fluids of the various tissues. With rapid decompression the nitrogen gas bubbles off in the blood. These bubbles act as emboli, block up the capillaries in one or another part of the body and, by cutting off the blood supply or by direct mechanical violence, cause the symptoms of compressed-air illness. Symptoms of illness may be prevented by making decompression slow enough to allow the absorbed nitrogen to escape from the lungs. Further experimentation by Von Schrötter,⁶ Hill and his associates,⁷ and others, have confirmed his theory. Post-mortem findings, moreover, in many fatal cases of compressed-air illness, both in men and in animals, give conclusive proof that this theory is correct.

From this theory, as well as from practical experience, the chief etiological factors have been deduced as follows: (1) In general, the higher the pressure, the greater the chances of illness; (2) the longer the time of pressure, the greater the chances of illness; and (3) the more rapid the decompression, the greater the chances of illness.

Let us now consider these three factors in brief detail.

1. *The degree of pressure.*—Practical experience has shown that cases of compressed-air illness seldom happen at pressures up to fifteen pounds per square inch above normal.⁸ Fatal cases seldom result from pressures below thirty pounds. The lowest pressure from which death has been reported is twenty-one pounds, and there seems to be some doubt as to the authenticity of this report. Among

⁶Heller, Mager and von Schrötter, *Die Luftdruckerkrankungen*, Vienna, 1900.

⁷Hill and Macleod, "Caisson Disease and Diver's Palsy," *Journal of Hygiene*, 1903, p. 401; Hill and Greenwood, *Proceedings Royal Society*, B. Vol. 77, p. 442, 1906; Vol. 79, p. 21 and p. 284, 1907.

⁸The figures in regard to pressure given in this paper all refer to the number of pounds per square inch above normal atmospheric pressure, which is a little less than 15 pounds.

twenty fatal cases of compressed-air illness resulting at the Pennsylvania East River Tunnels, only two were caused by pressures below thirty pounds, one at twenty-eight pounds, the other at twenty-nine pounds. The following table, taken at random from the records of the Pennsylvania East River Tunnels, illustrates the influence of only slight additions of pressure upon the percentage of cases of illness, when pressures in the neighborhood of thirty pounds were being used.

TUNNEL A. MANHATTAN SITE.

Month	Number of Man-shifts	Length of Shifts	Average Pressure Above Normal	No. Cases of Comp.-Air Illness	Per Cent
Jan. '07	8751	8 hours	28.5 lbs.	7	.18+
Feb. '07	4141	6 hours (2-3 hr. periods)	31 lbs.	25	.60+
Mar. '07	4902	"	31.5 lbs.	38	.67+
Apr. '07	4018	"	32 lbs.	39	.97+

It may be stated that, with other conditions the same, the number of cases of illness will depend directly upon the degree of pressure.

2. *The time under pressure.*—When pressures of one atmosphere or more are being used, the time spent under pressure is an important etiological factor. It is obvious that if less time is spent in compressed air than is necessary for complete saturation of the body fluids, the chances of symptoms developing upon decompression will be less than if that time is equalled or exceeded. The exact time in which complete body saturation takes place has never been determined. No doubt it varies in different individuals. It is certainly hastened by work and exercise. Some parts of the body saturate quickly and others slowly. Fat especially saturates slowly, both on account of its poor blood supply and because it has the property of absorbing about six times as much nitrogen as the other body fluids. Haldane and Boycott⁹ estimated that half saturation of the body occurs in about twenty-five minutes, and almost full saturation in about ninety minutes.

⁹ Boycott, Damant and Haldane, "The Prevention of Compressed-Air Illness," *Journal of Hygiene*, Vol. VIII, No. 3, June, 1908.

In the Pennsylvania East River Tunnels, when pressures of 30 lbs. and more were being used, all new men, before being allowed to work, were given a preliminary test at the prevailing tunnel pressure which lasted 90 minutes, decompression being at the rate of two pounds per minute. In 2719 preliminary tests only three cases of compressed-air illness were encountered. Two of these were mild cases of pain, and the third was a case of paralysis of the lower extremities. After the preliminary test, those who took it satisfactorily were allowed to work 90 minutes when six-hour shifts were in progress. In 2000 men who worked for 90 minutes in pressures averaging 32 lbs., seven cases of compressed-air illness resulted, all being mild cases. The small number of cases in the former group would indicate that complete saturation had not taken place in 90 minutes. The influence of work in hastening absorption would account for the increased number of cases in the latter group.

The following table, made up from the records of the Pennsylvania East River Tunnels, throws some practical light upon the question of the time of nearly complete body saturation and of the effect of work, and also indicates the effect of fatigue, as shown by a comparison of the number of cases following the first and the second three-hour periods of six-hour daily shifts:

Average Pressure (estimated)	Time under Pressure	Number of Men	Cases of Comp.-Air Illness		Remarks
			No.	Per cent.	
31 lbs.	1½ hours	2719 Preliminary test, not working	8	0.18+	2 cases ordinary pain. 1 case paralysis legs.
32 lbs.	1½ hours	2000 (estimated) Working	7	0.35+	All ordinary cases (pain, vertigo, etc.)
29 lbs.	2 hours	6000 (estimated) Working	18	0.21+	1 case pain and prostration, not severe. Rest, ordinary cases.
33 lbs.	8 hours 1st half 6-hr. shift	43,680 (est.) Working B. & D. Tunnels, Manhattan	152	0.35+	4 fatal. 2 pain and prostration. 8 partial paralysis. Rest, ordinary cases.
33 lbs.	8 hours 2nd half 6-hr. shift	"	317	0.72+	2 fatal. 1 pain and prostration. 1 partial paralysis. Rest, ordinary cases.

The decreased percentage of cases of illness from two hours work, as compared with that from one and one-half hours work, is accounted for by the lower pressures in the former case. At the same pressure, other factors being equal, two hours work would probably be followed by more cases than one and one-half hours work. In comparing results from three-hour shifts with those from one and one-half and two-hour shifts, it should be noted that in the former case the percentages were based chiefly upon old workmen; but in the latter the percentages were based entirely upon new men.

3. *The time of decompression.*—All authorities agree that the rate of decompression is a most important factor in determining the number of cases of compressed-air illness, as well as in determining their severity. During decompression the absorbed gases are liberated from the body fluids and blood in the form of bubbles, and are excreted through the lungs. The rapidity with which these gases are set free, and the size of the gas bubbles, depend directly upon the rate at which the pressure is removed. Consequently rapid decompression increases the chances of illness and slow decompression diminishes them. It is not known how long it takes for complete desaturation; like saturation it probably differs in individuals. The practical problem is to find, if possible, a safe rate of decompression. From practical experience it has been learned that with pressures up to 15 or 20 lbs. rapid decompression seldom gives rise to any symptoms, and probably never, even after long exposures of six to eight hours, to those due to large quantities of free gas in the circulatory system. An explanation of this, which appears logical, is that at these pressures not enough gases can be absorbed to embarrass the circulation even when suddenly liberated. That rapid decompression from pressures of four or more atmospheres is more dangerous than slow decompression has been repeatedly demonstrated in animal experimentation.

Bert concluded, from experiments with animals, that all trouble could be avoided by allowing thirty minutes for decompression from pressures between two and three atmospheres and sixty minutes for decompression from pressures between three and four atmospheres. Von Schrötter considers an allowance of twenty minutes per atmosphere safe; and Hill and his associates found twenty minutes per atmosphere safe for a large number of animals exposed to satur-

ation. Haldane,¹⁰ on the other hand, advocates the interrupted or stage method of decompression. Starting from the fact that rapid decompression from 19 lbs. to normal atmospheric pressure is comparatively safe, he argued that it would be correspondingly safe to decompress rapidly from four to two atmospheres, or from six to three atmospheres, and he found this true in a series of experiments with animals. He proposes the following rate of decompression for caisson and tunnel work:

Working Pressure in Pounds per Square Inch	Number of Minutes for each Pound of Decompression after the First Rapid Stage.		
	After first 8 hours' exposure	After second or third 8 hours' ex- posure following an interval for a meal.	After 6 hours or more of continuous exposure
18-20	2	8	5
21-24	3	5	7
25-29	5	7	8
30-34	6	7	9
35-39	7	8	9
40-45	7	8	9

His first rapid stage of decompression reduces the pressure in about three minutes to a point equal to one-half the actual pressure. To illustrate, if the working pressure is 40 lbs., the actual pressure equals 55 lbs. One-half of 55 or 27.5 equals the actual pressure, or 12.5 lbs. equals the gage pressure. Applying this table to decompression from 40 lbs., one would reduce the pressure in about three minutes to 12.5 lbs. and then allow 87.5 minutes for decompression after the first three hours' exposure.

Haldane presents strong theoretical reasons in proof of the advantages of the stage method of decompression. In his own experiments with goats, however, the beneficial results of stage decompression, as compared with the uniform decompression of equal time, are less apparent than the theory would lead one to expect. Hill and Greenwood¹¹ tested the effects of uniform and stage decompression on pigs without showing any decided advantage for the latter method. Hill says: "The conclusion to be drawn, then, from experiments on animals is that there is evidence in favor of stage decompression after

¹⁰ Haldane, "The Hygiene of Work in Compressed Air," *Journal of the Society of Arts*. Vol. XVI, p. 214. Jan. 1908.

¹¹ Hill, *Caisson Sickness*, Longmans, N. Y., 1912.

short exposures, but no decisive evidence of its superiority after long exposures. The theory is a captivating one, but experiment has not brought that conclusive support which was to be expected." In this statement by short exposures is meant periods of one hundred and twenty minutes or less.

Bornstein compared the effects of stage and uniform methods at the Elbe Tunnel Works, Hamburg, (two atmospheres), with the following results:

Days	Workers	Cases of Illness
20 stage	526	15
16 uniform	528	17
18 stage	529	12
16 uniform	529	14
14 stage	586	12

The percentage on the basis of man-shifts for the stage method is 0.15; and for the uniform method 0.19. These results show only a slight advantage for stage decompression, but they are not conclusive.

It would seem, then, that in the case of men working long periods in compressed air in pressures above 20 lbs., the question of the time taken for decompression is of more importance than the question of the method of decompression. Hill claims that exercise and the breathing of oxygen, both of which aid in the elimination of nitrogen gas, during decompression will safely permit of the reduction by at least one-half of the times of decompression advocated by Haldane.

In the Pennsylvania East River Tunnels, during a period of five hundred and fifty-seven days, with about one thousand men a day working in compressed air at pressures varying from 15 lbs. to 36 lbs., and a decompression period at the rate of one minute for each two pounds of pressure, there were reported to the medical department 3692 cases of compressed-air illness with twenty deaths. About ten thousand different men in all worked during this time. On the basis of the number of men working, the percentage of illness was 36.92 and the percentage of fatal cases 0.2. On the basis of man-shifts, estimating one thousand men a day for five hundred and fifty-seven days, or 557,000 man-shifts, the percentage of illness was 0.66 and the percentage of death 0.0035. The substitution of the

rate of decompression now required by the New York State law for tunnel work, of three pounds every two minutes up to 36 lbs. and of one pound per minute for pressure above 36 lbs., would no doubt have reduced the number of cases of illness, as well as the number of serious and fatal cases, but it seems highly improbable that it would have prevented all illness and death.

In considering the etiology of compressed-air illness it must be remembered that, beside the questions of pressure, time of compression, and rate of decompression, there are many other factors to be reckoned with, which might be called predisposing causes. Briefly stated these are as follows:

Age.—Boys, on account of underdevelopment, and men past forty are generally acknowledged to be bad subjects for compressed-air work.

Build.—Fat individuals are bad risks in compressed-air work and should be avoided.

Organic disease.—Persons with organic disease should not be subjected to work in compressed air because, even if they are not more susceptible to compressed-air illness, they are certainly less able than those with normal organs to stand the effects of such illness.

Alcoholism.—Alcoholics are bad risks for the same reason that those with organic disease are bad risks.

Newness to work.—"Green" men are more likely to have symptoms of compressed-air illness than old workmen.

Fatigue.—This appears to play a decided part in the causation of compressed-air illness.

Ventilation.— CO_2 within reasonable limits probably has no effect. Poisonous gases, such as CO and H_2S , may play a part in etiology.

The personal element.—This is a factor which I believe plays a large part in the causation of compressed-air illness. I have used this term for want of something more definite. Just what conditions may exist to make certain individuals susceptible to compressed-air illness or to cause those who have apparently been immune suddenly to develop symptoms, sometimes serious, I cannot say. It has seemed to me probable that certain individuals may lack the ability to excrete the gases from the blood at the physiological rate during decompression and that such a condition may arise at any time in men who have been free from it. In my experience I have found that certain men, who from careful examination appeared especially fit subjects,

fell easy victims to the effects of compressed air. In the work on the Pennsylvania East River Tunnels several old workmen had fatal illnesses while working under apparently the same conditions under which they had worked safely for months.

SYMPTOMS

The time is too short to allow of a detailed report in this paper of the symptoms of compressed-air illness. They are various in form and depend first upon the amount of gas set free in the blood, and second upon what organs are affected by the gas emboli. In many cases, as when soft tissues or unimportant organs are involved, gas emboli will give no symptoms. A small gas bubble causes pain when present in some unyielding tissue, such as nerve sheath or periosteum; it causes vertigo when in the semicircular canal; paralysis when in a motor area of the spinal cord; and sudden death when in a vital center of the medulla, or possibly in the coronary artery. Large accumulations of gas in the blood stream cause general pains and prostration, and in extreme cases collapse, coma, and sudden death.

In my study of 3692 cases I made the following classification, giving the number and percentage of cases falling under each group, as follows:

	No.	Per cent
A.—Cases showing pain in various parts of the body, "bends"	3278	88.78+
Cases with pain also having local manifestations	9	.26+
B.—Cases showing pain and prostration.....	47	1.26+
C.—Cases showing symptoms referable to the central nervous system:		
1. Brain (hemiplegia).....	4	.11+
2. Spinal cord:		
(a) Sensory disturbance	36	
(b) Motor disturbances	34	
(c) Sensory and motor disturbance ..	10	
Total (Spinal cord)	80	2.16+
D.—Cases showing vertigo, "staggers"	197	5.33+
E.—Cases showing dyspnoea and sense of constriction of the chest, "chokes"	60	1.62

F.—Cases showing partial or complete unconsciousness with collapse			17	.46+
Grand total			3692	99.98+
Fatal Cases	{ Group B.....	6		
	{ Group C.....	5		
	{ Group F.....	9		
			20 or .54+ per cent.	

PATHOLOGY

The results of autopsy in fatal cases have fallen largely under two classes: first, those which died after long illnesses and showed lesions of the spinal cord, such as disseminated and transverse myelitis and hemorrhage, with consequent complications, such as pneumonia, cystitis, pyonephritis, bed sores, etc.; and second, those which died soon after decompression, many of which showed the presence in greater or less degree of free gas in the circulatory system. Von Schrötter, in an analysis of one hundred and thirty-seven fatal cases reported between the years 1854 and 1897, found twenty reported autopsies showing lesions of the spinal cord and their complications, and eighteen reported autopsies in rapidly fatal cases of which eleven showed the presence of free gas in the circulatory system. In the twenty fatal cases reported by me, five fell within the first group, and of these two came to autopsy and showed lesions of the cord and complications; fourteen fell within the second group and of these, in twelve autopsies reported, eight showed the presence of free gas in greater or less degree in the circulatory system. In cases of sudden death, when no discoverable lesions have been found, it seems fair to suppose that death has been due to the involvement of vital centers by emboli too small to be detected. In several of our fatal cases no sign of organic disease could be found.

TREATMENT

Recompression is the most efficient means of treatment. This was recommended by Pol and Wattelle in 1854; Bert demonstrated its value in animal experimentation about 1871; and Mr. E. W. Moir made the first practical use of the medical lock at the old Hudson

River Tunnel. He there proved its efficiency, thus making it a necessary equipment in caisson and tunnel work.

The medical air-lock, as used on the Pennsylvania East River Tunnels, consisted of an air-tight steel cylinder about six feet in diameter and twelve feet in length, closed at one end. At the other end was an entrance by means of an air-tight door which opened inwards. The cylinder was divided into two compartments by means of a transverse partition, which had a door opening toward the inner compartment. Compressed-air pipes and outlet valves supplied both chambers, so that the pressure could be raised or lowered from either chamber. This arrangement enabled the physician or attendant to enter or leave the chamber in which the patient was being treated without disturbing the pressure of that chamber. Valves were also placed outside the lock so that the pressure could be regulated from without. The inner chamber was fitted with two bunks, one on either side, upon which patients could lie, and with electric lights, telephone, clock, pressure gage, thermometer, and electric heater. A means of ventilating the inner chamber was also supplied. Heavy glass windows were placed on a line in both doors so that one could watch from outside the patient, pressure gage, and thermometer.

Recompression should be instituted as soon as possible after the appearance of symptoms, the pressure being raised quickly to the working pressure. Relief of symptoms, when afforded, usually occurs before this point is reached. Soon after reaching full tunnel pressure decompression should be begun at a rate not less than one pound per minute, and in severe cases much more slowly. At the Pennsylvania East River Tunnels we thought our results were best when decompression was made rather quickly down to 10 or 15 lbs., and then continued very slowly. During decompression the patient, if able to do so, should move about and exercise the affected part. In severe cases massage and passive movements should be administered by an attendant, and in unconscious cases artificial respiration should also be performed. If symptoms return after one recompression, a second recompression should be made. We sometimes had to recompress three or four times before permanent relief was obtained. In cases of simple pain, where there is a return of symptoms after recompression, relief, frequently permanent, may be obtained by the use of counter-irritation with linaments, the vibrator, or the Faradic current, or by hot applications. A hot bath for the

return of pain after recompression is beneficial, but would hardly be indicated in cases where there is prostration.

The results of treatment in 3692 cases in the Pennsylvania East River Tunnels were as follows:

In 3278 cases of pain in various parts of the body about 90 per cent got relief from one or more recompressions. Recompression failed to give any relief in only about .5 per cent of the cases of this class, and in some of these the failure was undoubtedly due to improper recompression or to failure of the patient to exercise while decompressing.

In forty-seven cases of pain and prostration, thirty-eight were relieved or cured by recompression, all ultimately recovering, but six had only temporary improvement and died. The other three refused the medical lock, and recovered after illnesses of about a week.

In eighty cases with symptoms referable to the central nervous system the results were as follows:—

Four cases of hemiplegia were all cleared up permanently by recompression; of thirty-six cases of sensory disturbance, thirty-four were relieved by recompression, two refused the medical lock and were improved by medical treatment; of thirty-four cases of motor disturbance, partial or complete paralysis of the legs, twenty-three were benefited by recompression and either cleared up at once or recovered later, in eleven recompression caused no improvement and of these five ultimately died, three had permanent spastic paraplegia, and three were lost sight of; of ten cases of sensory and motor disturbance, nine were permanently relieved, and one was improved, but the final result was not learned.

In one hundred and ninety-seven cases showing vertigo, with or without vomiting, pain, prostration and dyspnoea, one hundred and eight had complete relief from recompression, eighty-two had partial relief from recompression, and seven refused the medical lock.

In sixty cases of dyspnoea and sense of constriction of the chest, all cleared up with one recompression except two which required a second recompression.

In seventeen cases of partial or complete unconsciousness and collapse eight were cured or relieved by one or more recompressions, but nine had little or no relief and died. Oxygen given to several of these severe cases during decompression afforded no appreciable benefit.

PREVENTION OF COMPRESSED-AIR ILLNESS

How to prevent compressed-air illness is a most important question. Modern demands in engineering require the use of compressed air. Recompression, while an efficient means of treatment in mild cases, often fails to prevent disability and death in severe ones. If high pressures are to be used, all means should be employed to prevent illness. These should consist of thorough medical examinations of workmen and especially of new candidates. In cases where "green" men must work in high pressures, 25 lbs. or over, preliminary tests should be given and, if satisfactorily passed, a short working shift should first be tried. Careful supervision of the workmen should be exercised, and occasional reexaminations made, especially after any absence from work. The men should be instructed as to the dangers of rapid decompression, should be made to move about during and after decompression, and should be warned that neglect to seek medical advice at once upon the appearance of any symptoms may result disastrously. They should also be informed of the bad effects of excesses of all kinds, of improper hygiene, and of intercurrent illness.

The following table indicates briefly what can be done by medical examination and proper supervision to eliminate the predisposing causes mentioned under the subject of etiology:

<i>Predisposing factors</i>	<i>Can be prevented</i>
Age (improper)	Yes
Build (fat)	Yes
Organic disease	To a large extent
Alcoholism	To a large extent
Newness to work	Partly
Fatigue	No
Ventilation (bad)	To a large extent
Personal element	No, not with our present knowledge.

The chief means of preventing illness must be found in the arrangement of shifts and decompression periods to suit the pressures. In this connection we find the old conflict between labor and capital. The workman is willing to reduce the shift but rebels at what seems to him an unnecessary time for decompression. The contractor, on the other hand, desires to offset long shifts by long decompressions.

Laws have already been passed in different countries regulating

the length of shifts and decompression periods. Such a law has been passed, however, in but one state (New York) in this country. As time goes on further legislation will no doubt be needed and this could be made much more efficient if full information in regard to all cases of compressed-air illness could be reported to the state and reviewed by some competent person or board, who should recommend the necessary changes in the laws. What is now most needed is an exhaustive study of the practical application of theories which have been well worked out. In studying the causes of compressed-air illness, one should not forget that many factors play a part, and that, since the human organism is concerned, it is not a purely physical question. The results of comparatively few experiments with animals should not be looked upon as final. In the same way, the results, under certain conditions, with a comparatively few men should not be considered conclusive. While much may be done by proper regulations to diminish cases of illness and death in compressed-air work, I believe that, when pressures of two or more atmospheres are being used, it should be classed as a dangerous occupation on account of individual conditions, not now understood, which I have called the personal element.

OCCUPATIONAL SKIN DISEASES

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With the exception of certain well-defined types, occupational dermatoses as a class have not, in this country at least, received the attention they merit. While every dermatological clinic numbers among its applicants each year many patients in whom occupation has a direct or indirect bearing on the causation of their eruption, it is difficult, owing to lack of systematic investigation, to give a definite idea as to the prevalence of skin affections in the various trades. At my own clinic at the University and Bellevue Hospital Medical College about 2 per cent of the total number of new cases for 1911 constituted occupational dermatoses. The great majority of these were of the type known as trade eczemas and, while many cases yield readily to treatment and proper preventive measures, others constitute a serious inconvenience from an economic standpoint, sometimes necessitating a complete cessation from work or a change of occupation.

Cutaneous vulnerability is more or less an individual peculiarity, for while persons are met with who are so sensitive to an irritant, physical, chemical, thermal, or actinic, that they react after a short exposure or contact by an acute dermatitis, other people remain entirely unaffected. Occasionally such individuals exhibit so high a degree of sensitiveness that, instead of acquiring an immunity, an increasing susceptibility is established. Fortunately these cases are not very common and it is more usual to see workers, though subjected to continuous injury, only after a considerable time develop lesions, either from the summation effects of the irritant or because the resistance of the skin has been gradually undermined. After such a cutaneous outbreak there is frequently a tendency to acute exacerbations at regular intervals or when the occupation is resumed. These eruptions may then persist for years.

While the skin, both anatomically and physiologically, is endowed with a relative amount of protection against the action of irri-

tant substances, by reason of its exposure it is subjected to injuries of every description and these may lay the foundation for a subsequent eruption. In addition there are other contributing factors, such as a special susceptibility, a delicate skin or one presenting some congenital anomaly, as excessive dryness or ichthyosis, impaired gastro-intestinal, hepatic or renal function, a depressed state of health, neglected hygiene of the skin, or its lowered resistance due to a preexisting eruption.

We often find the same etiologic factor operative in both allied and unrelated trades, owing to similar conditions under which the work is done; for example, where men or women are exposed to excessively dry or moist heat. Such an atmosphere leads to congestion and interference with the normal activity of the skin, which is followed by various inflammatory processes and sweat eruptions like prickly heat. These affections are met with in cooks, stokers, firemen, foundry workers, etc. A warm, moist medium, such as laundresses work in, sometimes produces a cystic condition of the sweat ducts of the middle third of the face, known as hydrocystoma. Cold, by favoring the development of chilblains, causes much suffering among people who are obliged to carry on their work outdoors or in poorly heated places. In factories where drastic measures are employed for the removal of dirt or stains, cleansing agents like chlorid of lime or benzine used on the hands, by divesting the skin of its natural secretions, supply the base for an eczema. Oil, which is used wherever machinery is installed, is the causative agent of acneiform and eczematous lesions in employees who operate or are otherwise engaged about such apparatus.

In occupations which necessitate standing, people who have a tendency to varicose veins not infrequently exhibit this condition, with a secondary eczema and ulceration. Slight traumatisms lead to erosions of the skin, which often become infected in patients who, owing to venous congestion, have slight resistance. Young women who are obliged to stand at their work sometimes develop erythema induratum or Bazin's disease, which is characterized by nodules beneath the skin that may break down and produce ulcers. Some of these forms of Bazin's disease have been proved to be tuberculous. The infection is usually of benign type and readily yields to rest in bed, improved nutrition, and a change to better hygienic surroundings.

Many occupations, without being pathological in the strict sense of the word, bring about changes in the skin which are so characteristic that Blaschko¹ has given them the name of trade stigmata. These include localized thickenings of the horny layer in shoemakers, tailors, musicians, etc.; bronzing of the skin in gardeners, farmers, and other people who follow outdoor occupations; staining of the hands in dyers, chimney-sweeps, etc.; pigmentation in workers in silver from a deposit of the latter metal and in millers from iron particles, etc.

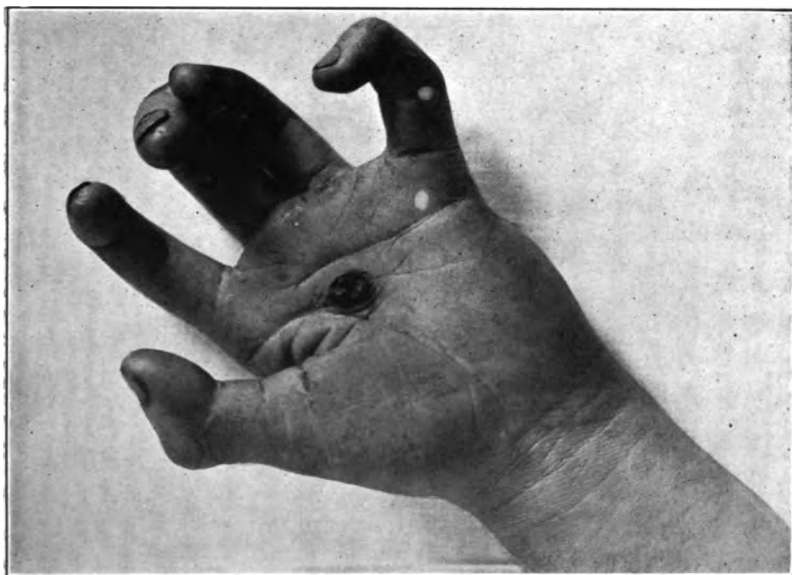
The skin responds to the most diverse irritants, on the one hand by the production of a catarrhal inflammation, and on the other by the development of different types of eruption from the action of the same agent. Of the former we have an example in the trade eczemas and of the latter in the effects of working with tar, where eczema, acne, warty and epitheliomatous lesions may exist alone or intermingled.

The commonest type of occupational disease is an eczematoid dermatitis. In a recent article Herxheimer² enumerates seventy-four trades provocative of this form of disease. It may vary in grade and intensity from an erythematous and scaling dermatitis to a vesicular and bullous eruption. As the condition becomes chronic, infiltration of the skin takes place, with desquamation and fissuring. With the cutaneous defenses lowered, pus infection is frequently superadded.

The excessive use of soap and water, by extracting the fat and macerating the horny cells, reduces the resistance of the skin. These agents may then act as direct excitants or prepare the way for some other irritant, as washing powders, etc. Severe eczemas of the hands and forearms are seen in those whose occupations require them to have their hands continually in water, as in the case of washerwomen, housemaids, barkeepers, etc. In my clinic nearly one-third of the occupational diseases during the past year were seen in persons whose vocations necessitated the frequent employment of soap and water, and in some cases of the various cleansing alkalis.

¹ Blaschko, "Gewerblichen Hautkrankheiten." *Handbuch der Arbeiterkrankheiten*, Th. Weyl-Gustav Fischer, 1908.

² Herxheimer, "Ueber die gewerblichen Erkrankungen der Haut." *Deutsch. Med. Wochenschr.*, 1912, Nr. 1.



I.



2.

OCCUPATIONAL SKIN DISEASES

1. PAPILLOMA OF PALM OF THE HAND OF AN IRON-WORKER. THREE YEARS' DURATION. LESION IS DUE TO FRICTION FROM THE TOOLS OF THE TRADE
2. COMMON TYPE OF CHRONIC ECZEMA OF HANDS AND FOREARMS FOLLOWING PROLONGED CONTACT WITH IRRITANTS. IN THIS CASE THE IRRITANT WAS WOOD-ALCOHOL USED IN THE PREPARATION OF VARNISH

In bakers a form of dermatitis of the hands and forearms is known as baker's itch. The exciting causes are the heat, the moist dough, and the saccharine solutions. A mite said to live in flour has also been incriminated. Candy-makers suffer from a similar eruption, as well as from impetiginous lesions. Confectioners, bakers, and preservers of fruit frequently show an eczema of the fingers and peri-ungual tissues from the action of fruit acids.

In a personal communication, Winfield describes a dermatitis in sugar-refiners, which involves the hands, forearms, and legs, and resembles an impetiginous scabies. It has been claimed that a mite found in raw sugar is responsible, but this lacks verification. Oliver^a states that in sugar factories a condition known as "lymphangitis of sugar-makers" is sometimes found among the sugar-refiners and molasses stirrers. It is accompanied by a slight constitutional disturbance and a crop of boils is not an unusual sequel. According to Gaillot the lymphangitis is a *Staphylococcus pyogenes aureus* infection. This organism is said to be found, not in the freshly made molasses, but in the residue, and the temperature of the factory and the condition of the skin favor its development.

Builders and masons develop an eczematous affection of the exposed parts of the body from the irritating effects of lime and cement. In stonecutters an analogous condition is caused by the stone dust. A palmar dermatitis is also seen in brickmakers. Metal workers, whether from the constant irritation of the dust or filings, their direct cauterant action, or that of acids or turpentine used in the various processes, suffer from all grades of inflammation to intractable ulceration. Printers and machinists, from contact with chemicals and oil, often develop a chronic eczema of hands and forearms. Electroplaters are also liable to an inflammation of the hands and forearms from the use of a mixture of lime dust and olive oil in "finishing" and of sour beer in the process known as "scratch brushing."

Workers who handle the chromates in the arts and trades suffer from an eczematoid eruption, as well as from ulceration of the skin and mucous membrane, which shows little tendency to heal. Hydrofluoric acid, employed in the manufacture of glass, the bleaching of cane, the washing of manure, etc., produces sores of the nasal orifice and gums and painful blisters and ulcers of the skin.

^a Oliver, *Diseases of Occupation*. E. P. Dutton & Co., 1908.

The irritant action of arsenic on the skin is well known. In the arts and manufactures where its compounds are employed, workers are attacked with eczema or ulcerative or gangrenous lesions, which may be present on the face, neck and extremities, but more especially the genitals. In color works ulcers of the hands are designated "arsenic pock." The sulfid of arsenic which, with lime, is used in curing fur, sets up a very severe dermatitis in furriers, not infrequently with persistent ulceration.

Chemists are prone to inflammation of the hands and sometimes of the face from handling various drugs and chemicals. Their skin often develops so marked a susceptibility that minute quantities or even fumes will call forth an outbreak. I have several times noted a similar anaphylactic condition from formalin in laboratory workers. Another familiar example of an eczema due to chemical action is that of the hands of physicians and nurses from the use of antiseptics, notably bichlorid of mercury and carbolic acid. These forms of dermatitis are very rebellious to treatment.

Among miners, smelter workers, and photographers an eruption of erythematous and pustular type is sometimes encountered from the irritant effects of mercury. Photographers are also subject to an eczema, more especially of the terminal phalanges and nails, from other reducing agents, particularly pyrogallie acid.

In hat factories eczema of the hands is said to result from the manipulation of hot water acidulated with sulfuric acid. The eczema in tobacco workers is believed to be due to the caustic solutions used in separating the tobacco leaves. Calico-printers suffer from eczema, fissures and wounds, which often become infected. The cause here is referred to the bleaching and cauterizing substances handled.

In flax and linen workers various skin affections are reported, among them a follicular eruption due to the oils and irritating materials met with in this occupation. In Belgium many of the flax workers show a peculiar abrasion and ulceration of the palmar surface of the hands. Fissures form, exfoliation takes place, and when the deeper structures are involved the condition stimulates a syphilitic lesion. An eruption resembling smallpox has also been described on the forearms, arms, and faces of workers who remove the bobbins from spinning-frames. From the pressure and friction

caused by pulling threads the people who engage in this part of the work present callosities on their index fingers.

Callosities of the palms are also met with in laborers, engine drivers, etc. Among miners they form a special dermatosis called "beat hand." Painful thickenings develop over the regions where the handle of the pick makes greatest pressure, along the bases of the fingers, over the ball of the thumb, and on the outer side of the hand. The subjacent tissue becomes inflamed, and not infrequently is further complicated by suppuration. To this condition the term "keens" is applied.

Warts sometimes form very troublesome lesions on the palms of people engaged in manual work. In some cases they are purely epidermic growths; in others, where the epidermis has been removed, the underlying tissue, as the result of irritation, becomes the seat of exuberant granulations with papillomatous formation.

Dyers and workers in anilin colors are apt to develop eczematoïd and pustular eruptions on different portions of the body. The bad effects are not limited to those in this trade, but the wearers of clothing prepared with certain of the dyes may ultimately be the victims of a severe dermatitis. The black, red, and orange-yellow pigments are particularly irritating, marked inflammatory reactions having been caused by socks, gloves, underwear, and shoes so colored. I have also seen unusually severe forms of eczematoïd dermatitis in barbers who had employed proprietary anilin hair dyes on their patrons. It is not an uncommon experience in dermatological practice to be consulted for a dermatitis of the face, neck, and ears which had followed the application of various of these hair dyes. In susceptible subjects the use of hair tonics may produce similar trouble. Another dermatological condition met with in anilin workers is a hyperidrosis of the palms due to washing the hands with chlorid of lime for the removal of dyes. According to Blaschko it may be so intense as to amount to a flux. The affection is also seen in chlorid of lime and soda workers.

The manufacture of chlorid of calcium and chlorid of sodium and potassium by electrolysis is sometimes attended by an erythematous and edematous inflammation of the face of the workmen resembling erysipelas. This is attributed to the hypochlorite of soda that is formed. With the subsidence of the acute process an acneiform eruption is left behind, the so-called chloracne. This is the com-

monest cutaneous malady met with in this occupation and is characterized by the early development of blackheads on the face, trunk, and extremities, followed by a grayish discoloration of the face. With inflammation and suppuration of the follicular glands, nodules, pustules, boils, and disfiguring scars are a not uncommon sequel.

Tar and paraffin workers develop a similar eruption which may last several months and then change to the so-called "tar itch." This is accompanied by hyperkeratosis and increased activity of the sebaceous glands, forming plaques and crusts, with the further development of multiple warts, one or more of which degenerate into malignant growths. The disease affects chiefly the hands, forearms, and scrotum. It progresses slowly and in many instances no recurrence takes place after removal of the epithelioma. Oliver cites the case of a man aged 58 who had worked among coal-oil and tar products for thirty years. He presented numerous indurated patches, some of which had ulcerated, as well as multiple black warts and scars, the remains of old ulcers. On the other hand, his son, 27 years old, following the same employment, developed a malignant growth of the forearm which necessitated amputation. Metastases of the axillary and cervical lymph nodes took place and the patient succumbed to secondary carcinoma.

Cancer in chimney-sweeps has been reported chiefly from England. The soot produces a chronic irritation of the skin, and when retained in such regions as the folds of the scrotum causes warty growths which become epitheliomatous. In some instances the hands, arms, and thighs have been involved. With the advent of machinery for cleaning chimneys the incidence of scrotal cancer has been markedly reduced. It is reported that gardeners who employ soot for the protection of plants from slugs show in a like manner the effects of this irritant in the development of malignant growths of the hands.

Gardeners and florists frequently suffer from some form of inflammation of the hands and arms occasioned by contact with certain plants. It is estimated that some sixty or seventy plants possess this irritant action and the power to induce a dermatitis. The more familiar ones are poison-ivy, poison-sumac, primrose, chrysanthemum, and eucalyptus, the eruption varying from a simple erythema to marked swelling, with the formation of vesicles and bullæ. Not only are the exposed parts involved, but the affection may be carried by the hands or clothing to other portions of the body. It is probable that

the active principle in the majority of these plants, as in the case of *Rhus toxicodendron*, is an essential oil. Lacquer which is obtained from a tree belonging to the genus *Rhus* produces a dermatitis either by direct contact or through the fumes from evaporation.⁴ The symptoms appear in a few hours, and consist of fever and edema of the skin of the face, limbs, and generative organs, nasal and conjunctival catarrh, and a papular eruption of the legs and forearms.

The resinous dust of certain hardwoods, like teak, ebony, satinwood, rosewood and others, will occasionally set up a dermatitis in carpenters and joiners. In teak the exciting agent is believed to be an essential oil derived from the central part of the tree and present in the dust. The symptoms are sometimes very severe, the eruption becoming generalized and accompanied by vomiting. It may last for several months and is quite apt to recur on resumption of work.

The so-called "polisher's itch" of the forearms and hands, met with in furniture polishers, is attributed to the methyl or impure alcohols present in varnishes and polishes. Impure benzine and turpentine used for cleansing purposes likewise provoke an eczema of the hands.

In individuals who follow an outdoor occupation the uncovered portions of the skin sometimes undergo peculiar degenerative changes. Under the name of "sailor's skin" Unna has described an affection which he observed chiefly in seafaring men. A diffuse cyanotic redness not unlike chilblain develops at first on the ears, on adjacent parts of the cheeks and temples, on the backs of the hands, and on the fingers. The skin then becomes mottled, pigmented, rough, and hard, and in places papillomatous. These warts may last for years and slowly undergo a malignant change. A similar condition is met with on the face, neck, and hands of people who follow agricultural pursuits. The cause is sought in the actinic rays. The effect of light on the skin is illustrated in X-ray workers, in whom, unless protected, the hands become the seat of a mild erythematous-squamous eruption, more or less persistent, which is succeeded by pigmentation, telangiectases, and atrophic wrinkling. This condition may remain unchanged, or keratoses may be added, which develop into epitheliomata.

Drivers and coachmen exposed to the rigors of the weather are

⁴ Castellani and Chambers, "Lacquer Poisoning." *Manual of Tropical Medicine*, 1910, p. 118.

often the subjects of the severer forms of rosacea. The use of alcohol, however, to which many of these people are addicted, cannot be wholly ignored as a contributing etiological factor.

Certain callings, notably those dealing with dead or live animals or their products, favor the development of infectious diseases. Owing to the prevalence of pyogenic organisms, local pus infections, as boils, carbuncles, impetigo contagiosa, or cellulitis are not infrequently met with in butchers, slaughter-house men, and other individuals who handle dead animal matter. A generalized bullous dermatitis, with severe constitutional symptoms and a high mortality, has also been observed. The starting point is usually an infected wound. Several years ago Bowen⁵ pointed to a possible relationship between these cases of so-called "acute infectious pemphigus" and foot and mouth disease of cattle, as he had observed such instances during an epizootic of the latter disease in New England. Foot and mouth disease takes place by inoculation of the skin or mucous membrane in butchers, dairymen, stableboys, and drivers. Herxheimer records having seen a case in a horsedealer.

The parasitic diseases which are more definitely identified with particular avocations are tuberculosis, anthrax, glanders and actinomycosis. Inoculation tuberculosis occurs in its simplest form as verruca necrogenica or anatomical tubercle. It is encountered chiefly among medical students, physicians, hospital ward attendants, and butchers as a localized papillomatous formation usually about the knuckles or other parts of the hand or forearm.

Anthrax is very uncommon in this country, but it is very prevalent in animals, especially cattle and sheep, in certain parts of Europe and Asia. In man the disease occurs as the result of direct infection from such animals or their products, via the skin, the intestines, or more rarely the lungs. It is met with in the wool-sorting, wool-combing and spinning industries, in horse-hair and brush factories, in stevedores, wharf-laborers, carters, farmers, shepherds, butchers, meat inspectors, and cattle salesmen. The internal form is known as "wool-sorter's disease." Of the external, which is also the more usual, there are two varieties, the malignant pustule and malignant anthrax edema, the latter of which is the more fatal of the two.

⁵ Bowen, "Acute Infectious Pemphigus in a Butcher During an Epizootic of Foot and Mouth Disease with a Consideration of the Possible Relationship of the Two Affections." *Journ. Cutaneous Diseases*, 1904, vol. xxii, p. 253.

Glanders, usually contracted from horses, is seen almost exclusively in hostlers or those who have to do with these animals. It is rare in this country. The bacillus may gain entrance through the mucous membrane of the eye, nose, mouth, or respiratory tract, or the site of inoculation may be a lesion of the skin. Clinically the disease is divided into glanders and farcy, according to whether the lesions of the mucous membrane or skin predominate. Both types present an acute and a chronic form.

Actinomycosis is endemic in cattle and more rarely affects horses, hogs, and other animals. In man the disease is seen in those who come in contact with such animals or who handle fodder or grain, as farmers, coachmen, dairymen, millers, etc. Infection in man takes place through a carious tooth or a lesion in the mouth, and less often through the skin. The ray fungus is believed to flourish on corn, hay, and cereal grains, as the latter has frequently formed the nucleus of an actinomycotic lesion.

Erysipeloid, an infection of the skin caused by poisoning from meats, fish, poultry, cheese, and similar animal products, is seen chiefly in butchers, fishmongers, poultry dealers, cooks and scullions. From Gilchrist's* observations, crab bites and injury by crabs are a frequent cause. The disease is believed by Rosenbach to be due to a micro-organism of the order Cladothrix. It is characterized by one or more areas of slowly spreading inflammation, clearing up at the part originally affected and progressing slowly to new areas, the advancing border being festooned or scalloped. Burning, pricking, or itching sensations accompany the affection, which involves chiefly the fingers and hands.

Among the minor infections may be mentioned ringworm transmitted from horses, dogs, and other domestic animals to men and boys employed about stables or engaged in the care of such diseased animals. Ringworm of equine origin is characterized by the formation of irregular and projecting nodular lesions studded with pustules involving the beard region, neck, wrist, or hands.

In certain grain regions infested by a mite, *Pediculoides ventricosus*, an intensely itching urticarioid eruption is epidemic among the farmers and laborers who handle sacks of wheat, barley, and other

* Gilchrist, "Erysipeloid, with a Record of 329 Cases, of Which 323 were Caused by Crab Bites or Lesions Produced by Crabs." *Journ. Cutaneous Diseases*, Vol. xxii, 1904, p. 507.

grains or straw harboring this parasite. Small epidemics have also appeared at different times from the use of mattresses made from straw on which the organism had made its habitat. To Dr. Jay F. Schamberg⁷ belongs the credit of priority in describing the affection in this country.

In conclusion, while many of the industrial dermatoses lead to little inconvenience, some forms of dermatitis may become so severe that they absolutely prevent a man from carrying on his occupation. In certain susceptible individuals the action of the irritant is not confined to the parts exposed, but may spread over the entire body. Where patients develop such an idiosyncrasy they should be guarded against these forms of dermatitis becoming permanent, and should be advised as to the best means of prevention. Such measures cannot be discussed at length in a paper of this scope, as they must necessarily fit individual cases. If the nature of the work permits, the wearing of masks and gloves to protect the exposed parts, as practised by Chinese lacquerers, is advisable, but obviously this is not feasible in all forms of occupation. The use of soap and water is to be recommended in some trades in order to remove the noxious substances; while in those instances where they prove the irritants they are positively injurious and should be sparingly used. In any case, after washing, the hands should always be very carefully dried and, if practicable, covered with a protective ointment, or a salve or cold cream should be thoroughly rubbed into the skin at night. People whose vocations bring them in contact with live or dead animals or their products should be instructed as to the mode of inoculation of infections from these sources, and all wounds or breaks in the continuity of the skin should be sealed with collodion, plaster, or some other protective dressing.

⁷ Schamberg, "Grain Itch (Acaro-Dermatitis Urticarioides): A Study of a New Disease in this Country." *Journ. Cutaneous Diseases*, 1910, Vol. xxviii, p. 67.

OCCUPATIONAL NERVOUS AND MENTAL DISEASES

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The nervous and mental diseases which may be called occupational are brought about by one or more of three agencies: (1) The occupation itself may be such as directly to cause damage to the nervous tissues, as when a cigarmaker gets a cramp or, neuritis, or a painter or worker in a lead factory gets an arm paralysis. This is a direct occupational disease. (2) The occupation may be such that exposure and the mode of work or life almost necessarily involve risks, temptations, or accidents which lead to disease. Thus cab-drivers suffer from occupational alcoholism, and soldiers in time of war and millworkers on very long hours suffer from occupational insanities of various kinds. These may be called indirect occupational neuroses or psychoses. (3) Nervous diseases may develop when work is carried on under such depressing conditions of meager wages or insanitary and unwholesome factory and home life that ill health necessarily follows. These may be called industrial neuroses and psychoses. With this broad view of the nervous diseases of occupations one can see that the subject is not easily exhausted.

DIRECT OCCUPATIONAL NERVOUS DISEASES

The direct occupational nervous diseases are quite numerous. They take the form of paralysis, atrophy, inflammation of the nerves of the arm or leg, neuralgia, paresthesia, and dysesthesia (disagreeable numbness, prickling, tingling, etc.). In most skilled workers, and in all kinds of workers who do one skilful act over and over again for long periods of time, we have the occupational cramps; writer's, telegrapher's, musician's, pianist's, etc. Though about ninety per cent of these troubles affect the arms and hands, the legs are also affected, and we have paralysis and pains in tailors, gardeners, and potato diggers, besides the more serious paralysis of the legs in caisson disease. The occupations which involve long

periods of standing also cause various foot-pains, due usually more strictly to mechanical disturbances of the ligaments, bones, and muscles than to nerves. Policemen, soldiers, and letter-carriers have podalgia, sciatica, and other painful troubles. The nerves of the head are least often involved, but miners suffer from nystagmus, boilermakers and rivetters from deafness, and workers with strong arc-lights from paralysis of the accommodation or light reflex muscles.

The general facts about these troubles were set forth by Dr. Starr and myself in papers read before the Academy of Medicine and published in the *Medical Record* of February 3, 1912. It was shown that among occupational nervous diseases, the most serious and frequent were those due to lead poisoning; and it has been shown by Dr. Alice Hamilton that lead is used and lead poisoning may occur in one hundred and eleven different trades. Arsenic, which is used in the furrier's trade and twenty-six others, is much less often a cause of nervous disease, but it has been in the past an important source of danger in the manufacture of wall-papers and in beer making. Mercury and brass occasionally cause symptoms of nervousness, tremors, and asthenic and anemic states.

The number of occupations in which, by reason of mistake or overuse of the hands and arms, we find neuritis, neuralgia, and cramps, is very large. I gave a list of twenty such occupations in my previous paper. In a Paris thesis, 1901, under the title *Occupational Neuritis*, Dr. Helene R. Baraks gives a list of one hundred and nineteen different occupations in which inflammation of some nerves, mainly those of the arm and shoulder, was due to the work in which the persons were employed. She reports over two hundred cases illustrating the different conditions. Bruising and pressure on the parts and overwork are the immediate causes. In New York the occupations which contribute most often to these troubles are those of tailors, cutters, ironers, pressers, laundry workers, musicians (pianists and violinists), porters and other carriers of heavy weights, stenographers, telegraphers, and bookkeepers.

The occupational nervous troubles, aside from those due to the caisson disease and to lead, and aside from the cramps, are not very serious. They are curable as a rule in a few months. In rare cases, however, they pass on to serious and progressive organic disease

(atrophy or sclerosis). These troubles are caused partly by carelessness and uncleanness and perhaps more often by prolonged and excessive work.

If I were to single out any one point for special attention and action, I should advise that short pamphlets be written to be circulated among ironers, pressers, tailors and especially cutters, cigar-makers, masons, and boilermakers, whose work involves heavy, regular manual movements; and also among workers in compressed air and those who have to handle arc-lights, cautioning them against the dangers and showing how they may be avoided. The dangers of lead, mercury, arsenic, phosphorus and caisson work have already been fully explained. The remedies have only to be applied.

Summing up, one may say that the principal occupational nervous diseases are:

1. Toxic: Lead palsies, neuralgias, psychoses.
 Arsenical palsies.
 Mercurial tremors, etc.
2. Mechanical: Paralyses, neuritic and atrophic.
 Atrophies.
 Parasthesias.
 Neuralgias.
 Spasmodic disorders.
 Caisson paraplegia (the "bends").
3. Environmental: Exhaustion (auto-toxaemia).
 (Neurasthenia, psychasthenia, insanity).

MENTAL DISTURBANCES DUE TO OCCUPATIONS

The occupational psychoses, or mental disturbances due to occupations, furnish practically an unexplored field and perhaps not a fruitful one. That is to say, occupation is essentially a healthful thing, much more so than recreation or rest; and I would urge that the aim of the social and industrial reformer be not to lessen occupation, but to make it easier and more agreeable, or at least more interesting. There is nothing so mentally healthful as work.

There are, consequently, very few occupations which directly, by

reason of the kind of work, cause insanity. Nevertheless, there is a lead insanity, an alcoholic insanity, and an insanity caused by sulfid of carbon and by sulfureted hydrogen; also perhaps a mental deterioration, especially of memory, in those exposed to CO_2 . Then there are certain occupations which are in their nature exciting or one-sided in their demands on the mental life, and Dr. T. H. Kellogg enumerates soldiers (and sailors), poets, prostitutes, and politicians as being especially liable to insanity. To this list others have added the occupations of cab-driver, stoker, and bartender. Millworkers who tend machines for long hours are said by Spoultling to contribute unduly to the state hospitals for the insane.

The insanities due indirectly to occupation and industrial conditions are, moreover, very numerous and important. Forel says: "Other causes, such as the herding together of the proletariat in great cities, in bad rooms or tenements with insufficient food and unhealthy employment, undoubtedly weaken the nervous system." And Dr. Kaplan, in enumerating the causes of that devastating form of mental degeneration, dementia praecox, says:

Most, if not all, of my patients came from the congested districts of Greater New York; they lived in tenement houses; they were deprived of light, proper sanitation, fresh air, and good food; they worked in sweatshops for means of getting their livelihood; they were in constant struggle and strife for the maintenance of their existence. Some of the married women were compelled to work in shops, in addition to their housework, in order to support the family. Seventy-two patients did housework; thirty-three were employed in shops; three had positions in stores; eight were dressmakers; two were bookkeepers; three stenographers; one a governess; one an attendant in a hospital for the insane; two clerks; one a student; four had no occupation.

INFLUENCE OF GENERAL INDUSTRIAL CONDITIONS

All this, however, is in a way only incident to industrial progress and more intense social activity. The occupation of becoming highly civilized leads to increase of insanity. In the north of Italy, among the active industrial population, says Tanzi, the percentage of insanity is 25.3 per 10,000. In southern Italy it is 1.3 to 6.6 per cent. Crowd people together and there surely will be more insane. Occupations compelling life to be lived under congested conditions are thus indirectly the cause of insanity. If we wish to improve industrial conditions with a view to improving mental

health, we should discourage urban industries, especially urban factories.

This is not because of the industries or the factories, so much as it is because of the mode of living. What is the use of high wages and short hours if life away from work is unhealthful? The occupation of making shirtwaists may keep one well or drive one insane, according to the nature of the home and the kind of rest and amusements which are taken. But we should also discourage industrial isolation. Man needs social life as much as he does fresh air and good food. Men are like certain trees which do best when they are planted just so far apart; not too close, for then the roots encroach and rob each other of nourishment; and not so far apart that there is no support and protection from the sun and winds.

The active money-earning occupations of life, then, have really little in themselves to do with causing the great mass of nervous and mental disorders. It is what is done between times, what kind of rest is taken, and what kind of home life is lived. It is this which does the harm. Women have many more nervous troubles than men, but they have fewer occupations and the fewer they have the more they get nervous. It is, then, I repeat, not occupations themselves, but the industrial and domestic conditions to which working people are subjected which cause the mass of nervous and mental diseases.

Take a man or a woman and make him or her do a dexterous piece of work over and over again during long hours and under a nervous strain. Underfeed a little, shorten or disturb the sleep, and you can produce neuralgia or neuritis or a cramp within from two to three months. Take a person who has not a very stable nervous system and put him at work for long hours, at tasks of concentration or skill. Let him have no real recreation and not quite enough restful sleep and you can produce a mental trouble of at least a minor type.

Those who work on a certain tension, like mill operatives in charge of machinery, engineers, etc., and those who work always with a strain and effort to finish a certain fixed amount in a fixed time, get nervous or mental troubles unless they have periods of real recreation. Real play is needed for hard, tense work. For the ordinary worker it is not so important. Scientific manage-

ment, therefore, which speeds up the human machine, must give it longer rest and an absolute change of nervous and mental interest.

The direct occupational causes of mental diseases are, then, of small importance. The industrial causes, however, which lead to bad home conditions, bad forms of recreation and rest, bad social and moral conditions, are of immense and fundamental importance. We could lessen insanity more by razing tenement-houses than by shortening hours of labor. Occupation is mentally healthful; play may be exhausting and dangerous. Give the hard-working man knowledge and opportunity to spend his leisure well, just as seriously and just as quickly as you give him more leisure. Some legislation, but much more ordinary good sense and sanitary rules should be preached. I would say, then, in conclusion, that occupational and industrial nervous diseases call for special attention on the part of the sanitarian and of the legislator.

OCCUPATIONAL EYE DISEASES

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If we are to judge from the relative space assigned to them in our books, the importance of occupational diseases of the eyes has not been properly estimated. There are many industries which regularly cause serious organic diseases of the eyes while, in the wider sense, there are few skilled occupations in which the eyes are not used far beyond nature's intentions, with corresponding discomfort and disability. I have no intention of giving you a catalogue of the rare diseases which have been observed from time to time in connection with our modern highly specialized industries, but I do wish to call your attention to several distinct types of occupational disease and to assure you that of each variety there are numerous subvarieties.

EXPOSURE TO INJURIOUS SUBSTANCES

Trade accidents should not, of course, be classed as trade diseases, whether of the eye or of other organs. It is very difficult, however, to draw any hard and fast line between the occasional injuries which must be classed as accidents, and those which, like injuries from dust, are due to constant exposure to injurious substances and must, therefore, be assumed as conditions of the industry. To lose an eye from the impact of a popping cork is doubtless an accident, though not by any means so rare a one as you might suppose. But, in the bottling industries, accidents of this sort happen so regularly that they have to be considered as incidents of the trade and guarded against accordingly. The same may be said of the bursting of unprotected water gages and of other similar accidents which so often destroy the eyes of engineers and machinists. The daily total of more or less dangerous injuries to the eyes of workmen is something enormous.

Consider the men employed in the various grinding trades. In working over an emery wheel, for instance, there is a constant stream of small particles thrown off at great speed. The experienced man has learned to save his eyes as much as possible, but the beginner is always in trouble. When these particles are small they are removed from the eye by a fellow workman with the corner of a dirty handkerchief, the soft end of a chewed toothpick, or the point of a penknife. Every large shop has some man who is particularly expert at removing these foreign bodies, and it is only when they are too deeply embedded for the amateur operator's skill that they are referred to the physician. The writer often sees half a dozen or more cases in a single afternoon in his dispensary service, most of them showing signs of previous manipulation. Considering the chances for infection, bad results are astonishingly rare. Nevertheless, there are many cases in which infection does occur, resulting in extreme pain, loss of time, more or less permanent disability, and most infrequently in the loss of the eye itself. It must not be forgotten that every one of these foreign bodies, except the most superficial, produces a minute but permanent opacity of the cornea, which if rightly situated interferes seriously with sight. I have seen many men with numerous scars in each eye as the result of repeated injuries of this kind, and yet they seem to learn nothing, the same ones coming back time after time in spite of warning and advice. The various safeguards that have been devised do not seem to be practical, for opposition to their use seems to come from the men rather than from their employers.

Then there is the less frequent but much more serious list of injuries caused by the larger bits of metal and stone in foundries, quarries, and mines. These chips fly through the air with tremendous velocity and not infrequently pass clear through an eye. These are, of course, accidents and are therefore rather outside the limits of this paper, but they are for the most part preventable and they should be prevented.

There are many other trades each of which has its own peculiar type of injury, like the lime burn and the solder burn. Practically all the so-called dusty trades cause chronic inflammation of the eyes, which not only makes trouble in itself but predisposes to various infections. Masons and plasterers not only suffer from lime burns but commonly have chronic conjunctivitis, as do flour-mill

employees. Hop pickers suffer from an acute inflammation of the conjunctiva during the season, and farmers and other outdoor laborers who are exposed to wind and dust very often develop pterygium.

TRADE POISONING

There are also many trades in which the workmen suffer more or less permanent loss of sight through the absorption of drugs of one sort or another, and the number of these is constantly increasing as the complexity of our manufacturing processes increases. I have no intention of giving you a list of all the chemicals which are on record as having produced blindness. The list is a long one and many of them are important simply as suggesting profitable directions for future investigation. Among them are tobacco; alcohol; lead, used in so many different industries; bisulfid of carbon, used in the manufacture of rubber; nitrobenzol, used in the manufacture of explosives; and some of the anilin dyes.

The one to which I wish particularly to draw attention is methyl or wood-alcohol. Owing to its low price it has very largely displaced grain alcohol in manufacturing processes. It was never intended for internal use, but has long been consumed by the ignorant and benighted as furnishing a cheap and very potent source of intoxication. Such sprees often end in death and more often in a specific type of blindness. Since attention has been devoted to this subject, it has been found that in susceptible individuals a very small dose of wood-alcohol may produce permanent total blindness. Ten drops have produced this effect in one case. Furthermore, instances are accumulating in which the same result has followed its use as a substitute for grain alcohol in bathing and rubbing.

But the fact that compels us to class wood-alcohol blindness with the occupational diseases is the increasing number of cases in which it has followed mere inhalation of the vapor for a comparatively short period. It is used in many of the trades as a solvent of shellac, as, for instance, by painters and hat makers. Many typical cases are now on record of blindness in painters, who have used it in removing varnish in close rooms or in applying shellac to the inside of beer vats and the like.

There are probably many cases of wood-alcohol poisoning which are entirely unrecognized. Tyson reports a whole room of girls in

a pencil factory who suffered from ill-defined disturbances of vision, among other symptoms. It was finally discovered, almost by accident, that the pencils were varnished with wood-alcohol, and with suitable ventilation the trouble disappeared.

Apparently there is no valid excuse for the manufacture of wood-alcohol. Its actual cost is much greater than that of grain alcohol, and its manufacture results in the denudation of mile after mile of growing timber. To facilitate the use of grain alcohol in the arts the government permits the sale of the so-called denatured alcohol tax free; but unfortunately one of the processes of denaturing consists of adding ten per cent of wood-alcohol, which is sufficient to make even denatured alcohol dangerous to the susceptible. It is, perhaps, beyond the scope of this paper, but Holden has recently called attention to the fact that many retail druggists sell wood-alcohol over the counter under various names, not only without any indication of its poisonous nature, but with the phrase on the label "guaranteed under the food and drug act", which many people understand, not as a guarantee of purity, but of harmlessness.

We have much to learn about the subject before we can legislate intelligently. The manufacturers claim that the pure wood-alcohol is harmless, the poisonous brands being those incompletely refined, while even the latter are safe enough if sufficient ventilation is secured.

DISABILITIES DUE TO EXPOSURE TO LIGHT

There is another long list of more or less serious disabilities which result from exposure of the eyes to artificial light, made necessary by our modern factory conditions. Electricians are dazzled and sometimes blinded by sudden exposure to the intense light caused by blow-outs and short circuits. Too intense light, like that of the arc lamp, decomposes the visual purple faster than it can be regenerated and causes a condition of retinal exhaustion. It also causes, in the effort to exclude the light, a constant extreme contraction of the pupil, which is both painful and fatiguing. This accounts for the asthenopia which is so common in many trades which, like those of gilders, metal polishers, and glass workers, compel a close attention to polished surfaces which reflect light.

The modern methods of industrial lighting have made the composition as well as the intensity of light a subject of great practical

importance. Incandescent gas and electric lights contain many of the violet and ultra-violet rays, which are not only useless for illuminating purposes, but are capable of causing effects on the eye not unlike a modified snow-blindness. The worker who is exposed to them day after day often develops annoying inflammations of the lids and conjunctiva, and also often suffers from asthenopic symptoms which vastly diminish his efficiency. Furthermore, their effect on the deeper structures of the eye is suspected of being still more serious. The refractive media of the eye absorb most, if not all, of these ultra-violet rays, so that the retina suffers little harm, but it is quite possible that the continued process of absorption may be one of the causes of cataract. It is certain that stokers, bottle makers, glass-blowers, and others who are continually exposed to very intense light and heat have an enormously increased liability to cataract. One foreign observer found that as many as 40 per cent of the bottle makers in one establishment showed evidences of cataract, though the great majority of them were under forty years of age. The left eye, which is nearest the fire, was invariably affected more than the right.

DISEASES DUE TO OCCUPATIONAL STRAIN

There is also a very large group of diseases, organic or functional, which are due to prolonged use or excessive strain of the eyes. The eye is one of the most complicated organs in the body. Perfect single vision requires not only two good eyes but their complete co-ordination, which is accomplished by the joint action of fourteen separate muscles. Four of the twelve great cranial nerves are devoted exclusively to vision. When one stops to think that most people use their eyes almost constantly and that many tasks involve a continuous strain for hours at a time, one begins to understand why vision necessitates expenditures of nerve and muscle energy beyond almost any other function.

There are at least three distinct types of eye fatigue which show themselves in different trades. We have already alluded to the retinal fatigue resulting from the constant watching of polished or reflecting surfaces, resulting in the asthenopia of gilders and polishers. Next comes the muscular fatigue which we see in the trades that compel the constant use of the eyes for close, fine work. ✓ The perfectly normal eye sees things close at hand only by a process

of accommodation or focusing, which is a muscular effort and which produces a normal fatigue. It is, therefore, perfectly possible to strain healthy, normal eyes by overwork. In most of the so-called errors of refraction, hyperopia, astigmatism, and the like, distinct vision is only possible by overaccommodation, and the individual who has to accommodate too much naturally becomes tired sooner than he otherwise would. Holden, in a very interesting paper, calls attention to the fact that one of the first occupational diseases of which we have any record was the scholar's disease; his headache, his eye pains, his indigestion, and his pessimism were ascribed to his sedentary life and his brain work. Many of the ills which the scholar endured were due to overuse of his eyes and are to-day relieved by the use of suitable glasses. But the scholar no longer has any monopoly of either the symptoms or the life. To-day there are many trades in which the workman sits hour after hour chiefly engaged in watching intently—a task which eventually tires even the normal, healthy eye. And among the factory workers, badly housed, ill fed for generations, diseased, refractive errors, which are for the most part congenital, are not only practically universal, but often so great that they cannot be compensated for by any amount of strain.

Consider the garment workers, for instance. They all suffer from errors of refraction, large or small. They have less than the normal compensatory powers because their muscles are overworked and badly fed. They work long hours in close, badly ventilated, badly lighted rooms, driven to the utmost. The least muscular relaxation means indistinct vision and mistakes in their work, and for every mistake there is a regular tariff of fines and deductions. The constant strain to see distinctly results in a whole series of eye symptoms. The muscular fatigue causes headache, which most operatives seem to consider an inevitable incident of life. The eye, like the hand, has its muscle cramps from overstimulation, and its pareses from exhaustion, but, while the cramp of writers and telegraphers is regularly included in the list of occupational diseases, nothing is said of the far more common ciliary spasm or the convergence insufficiency of the eye worker. The nervous exhaustion which follows the effort to stimulate tired ocular muscles day after day is certainly one at least of the causes of lowered vitality and depression. Neurasthenia and the other

fatigue and attention neuroses are said to be practically universal among the garment workers, and no small part of it can be ascribed to eyestrain.

Miner's nystagmus has always been described as the type of occupational disease resulting from eyestrain of a definite sort. Progressive myopia is no less so. Practically unknown in infancy, it first appears occasionally in the early years of school, and becomes more and more common as the children advance from grade to grade. In the various social classes it is found to be in direct proportion to the amount of close work which they have to do. Among the German lithographers Cohn found that 45 per cent were myopic and among the typesetters 51 per cent. The same practical conclusions are true the world over. The myopic eye is a diseased eye and progressive myopia means a gradual failure of vision, constant liability to ocular inflammation, and in many cases final blindness. It is a true occupational disease which in Germany accounts for approximately ten per cent of blindness.

CONCLUSION

I have given a very brief resumé of certain types of disability which may affect the eyes as the result of certain occupations. Before we can possibly have wise legislation we must have far more exact knowledge of many of them. Accidents and injuries are, even to-day, passably taken care of. They are interesting to the physician, and their cause, their treatment, and their prevention are often so obvious that much progress has already been made in reducing their frequency.

The study of the trade poisonings which affect the eyes is still, however, in its infancy in this country, and is not likely to progress much till a change is made in the method of investigation. The hospital physician is in no position to study them. They come to him as isolated cases, often in patients who speak little or no English and who work at trades the details of which are unknown to him. Most of them have no pathognomonic symptoms to distinguish them from similar conditions which are not occupational. I am sceptical of the scientific value of the compulsory reporting of such cases. It will doubtless reveal occasional extreme typical cases and be worth while from an educational standpoint and from the standpoint of punishing legal infractions, but that it will add

much of scientific value to the specialist's knowledge of occupational diseases I doubt. The place to study these conditions is not in the hospital or the clinic but in the factory. What we need is an intensive study, once for all, of each of the important trades by a group of trained observers.

Personally I believe that the eye diseases due to fatigue are far more important than we commonly suppose. More people are blind from malignant myopia and retinal detachment than from all the trade poisonings. More inefficiency and more misery are caused by defective eyes than by diseased ones. There is no field in which it would be easier to enlist the enlightened self-interest of employers. Any intelligent shop management must consider the eyes of employees. There may be a place in our modern factory system for the lame and the halt, but not for the blind or the partly blind. Professor Munsterberg can tell by psychological tests whether it will be worth while to train a girl as a telephone operator. The oculist, in his turn, can not only do a good deal to convert unprofitable into profitable employees; he can pick out employee after employee whom no intelligent man could afford to hire. More than this he can form a pretty good estimate of those who are fit to-day but will be unfit to-morrow. There has been so much exaggeration on the subject of eyestrain that the medical profession has disgustedly refused its attention, and yet I know of no one factor that affects the earning capacity of the laboring classes to such an extent. I know of no medical field to-day in which the poor and the ignorant have been so entirely abandoned to the care of the incompetent and the dishonest. Here again intensive study is needed.

INDUSTRIAL POISONING

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There has been a great deal said in the past few years about the general problem of industrial hygiene, but until very recently there has been a deplorable lack in this country of precise information in regard to industrial intoxication. Even yet, in spite of the investigations made by Dr. Alice Hamilton, Dr. John B. Andrews, and others for the Labor Bureau, the Illinois Industrial Disease Commission, and the American Association for Labor Legislation, we do not have anything like the detailed information which is available in Europe. I have been able to get more information in two or three days from an official introduction in a foreign country than I can get in this country in two or three months. The only difficulty there is that the manufacturers are often afraid you are looking into trade secrets; they don't care how much you look into trade health.

Yet we know that conditions in this country are certainly as bad as conditions abroad. There used to be claims that, owing to our great national ingenuity and inventiveness, or to other causes, there was not so much industrial disease here and that, therefore, we did not need the rigid legal control which they exercise in other countries. But the recent investigations of phosphorus and lead and mercury poisoning show that we are dealing with conditions that need attention here just as much as abroad. Dr. Thompson has mentioned his experience in New York with regard to lead poisoning, and I have had some experience in Philadelphia. From my own records I could produce more cases of lead poisoning from each of two white-lead works there than from any similar works in Great Britain. I have gone over the records of some of the latter and know what they are.

The work I have done, however, has been purely individual. Official information and investigation is much better. The experience we gain from unofficial investigations is very vague and fragmentary and brings to light only a fraction of what exists. As good

evidence as I have ever had of this fact was in connection with two large plants, both of which used carbon bisulfid and lead. One manufacturer told me they had so little trouble they did not pay any attention to it at all. The other plant, carrying on the same processes, told me with the greatest openness that they had considerable trouble with carbon bisulfid and lead in spite of great precautions. It is essential to get precise and definite studies on the subject from an official standpoint.

Such studies are particularly necessary, I believe, by reason of the fact that a great many processes in this country differ from the processes abroad. It is an interesting fact that Great Britain has had a different problem to deal with from that in Germany. As we know, Germany's vast commercial importance is the development of the last half century or less and it has been possible, therefore, to put into effect there almost any law affecting the health of employees without greatly disturbing the manufacturer. In England many persons carried on trades in very old localities and old shops and if they had enacted drastic laws immediately they would have destroyed their industries. They had different conditions. We are only making a beginning at regulation and are far behind both Germany and Great Britain. But we must know our own conditions, and not go too much on observations in other countries, if we are going to deal justly with our industries. From the United States Bureau of Labor and other such sources we must get the information we need. No one need feel, because we have acquired some valuable knowledge of conditions in the last two or three years, that we have approached a fraction of what is really important.

In getting this information and in drawing up regulations based upon it, the first thing we need is uniformity,—uniformity between investigating agencies and between states. If we cannot have uniformity in the first place we will have trouble in classification. Moreover, it is extremely important in legislation, for any regulation of these things in one state, when there is no regulation in surrounding states, may do such harm to industries that they will move to another state or new industries will not develop there. Uniformity is the first step in regulation.

The reporting of industrial diseases, and the reporting of a larger number than now required in the eight states that demand such reports, furnishes the most important source of information. The

importance of this is at once recognizable by anyone who knows even vaguely the effect of the reporting of infectious diseases, though very few except those interested know the profound effect of the reporting of industrial diseases. As a striking example of this, I was talking with Dr. Legge, the head of the medical inspection of factories in England, in regard to their regulations concerning industrial intoxication. His long experience under the British reporting law has made him familiar with almost all the plants in Great Britain, and particularly with all the different operations of these plants. He told me, if I wanted to see a curious difficulty which they had not been able to remedy, to go to a certain pottery. Then he pointed out various plants elsewhere that exhibited simple or more complex means of overcoming particular dangers. This detailed information gave him precise knowledge as to where any company needed to be corrected and where they did not need to be corrected. There is other important information that cannot be gained in any way except by the reporting of diseases. In particular it gives a definite idea as to whether or not regulations are doing the right amount of good.

Another fact that the reporting of industrial diseases opens out is the occasional necessity for rather drastic special regulations in regard to matters of this kind, such as the French laws concerning the use of lead paint. In England they have had little improvement, owing to their regulations, in lead poisoning among painters. It may be that they will be forced into drastic prohibitory laws like those in France.

The medical inspection of working people exposed to conditions of this kind will unquestionably, I am sure, lead to improvements of conditions equal to those from reporting diseases. The manufacturers abroad that I have talked with about this, and I talked with a number in England, were actually enthusiastic then, though they opposed it at first. Some told me that, although required by law to have an inspection once a month, they had voluntarily introduced it once a week because it had the value of detecting any trouble at once. The manufacturer has been rather condemned this morning by one or two speakers. My experience has been that very frequently he is quite as willing to cooperate as anyone else. Manufacturers may be divided into three classes: those who are educated as to the value of these matters, those who are willing to be educated, and

those who are uneducated and unwilling. But many of them are willing to do what they can if the matter is once made clear to them.

An essential thing that, it seems to me, needs to be done in overcoming the conditions we are facing is to establish some definite standards. That is true of anything relating to industrial conditions or anything else. You cannot make improvements unless you know the standard of improvements. Most of our laws in regard to industrial hygiene throw the whole burden on the medical inspector. If he is an honest and capable man he may do it well. If he tends to be a grafter, he can use his position for that purpose. If he is uninstructed he does nothing. In England the regulations in regard to potteries fill a large pamphlet, going precisely into every detail. This is fair to the manufacturer, because he knows what he must do; but it holds him up if he does not do it. Standards should be given in every instance when possible, so that the manufacturer may come up to the standard and not just vaguely try to do the right thing. Even then inspectors should be trained.

Another important thing is that the regulations shall not be dependent upon the occasional meeting of a state legislature, that there shall be some provision similar to that in the English law, which practically gives the Secretary of State power to modify these regulations as may seem to him wise if he submits the changes to the action of Parliament as soon as possible; but in the meantime he can protect working people from changes in processes, or other things that might be dangerous, and not wait for indefinite periods.

There is only one thing more I should like to say, and that is that I think we have been and still are altogether too prone to consider occupational poisoning of various kinds merely as showing certain picturesque results. We tend to look on colic, palsy, and encephalopathy, for example, as being all of the important effects of lead poisoning, but the main effects of lead poisoning are other things; much more ill health is caused by the general effects on the health, the arteries, the kidneys, and digestion. I think we have no more right to speak of lead colic and such things as the main effects of lead poisoning than we have to speak of drowsiness as the main effect of the morphine habit. Any statistics that we can get only show a minor fraction of the results of these intoxications. They undoubtedly cause many times the bad results that appear from these definite, discoverable consequences.

COOPERATION IN PROMOTING INDUSTRIAL HYGIENE

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Nothing could better illustrate the advantages of cooperation in our efforts to promote industrial hygiene than the papers that have been presented at this Conference, or indeed than this Conference itself. The greatest present need in this field in the United States is undoubtedly fuller knowledge. We need to know more accurately what are the occupational diseases to which American wage-earners are exposed. We need to know the conditions which give rise to these diseases in the occupations in which they are found. Finally, we need to know the easiest and most effective means of changing conditions so that these diseases may be prevented. The fact that this is only the *Second* National Conference on Industrial Diseases is evidence of the tardy attention we are giving to occupational diseases in this country. For some time to come careful, intensive studies, like that described by Mr. Hoffman, must precede the introduction of remedial measures.¹

If fuller knowledge is what we most need, the group to which we must look for light is obviously that of the trained physicians who have taken to heart the old adage that an ounce of prevention is worth a pound of cure, and who are deliberately turning aside from the work of curing the sick to the more important, if less appreciated, work of searching out the causes of sickness and devising measures that will narrow the field over which these causes operate. But in connection with occupational diseases physicians require, perhaps more than in any other department of preventive medicine, the cooperation of other groups. This is because occupational diseases must be studied not merely in the symptoms of

¹ The results of one such study have been published in a monograph by Mrs. Linton Bates on *Mercury Poisoning in the Industries of New York City and Vicinity*, by the Women's Welfare Department of the National Civic Federation. Copies may be secured by application to the American Association for Labor Legislation, Metropolitan Tower, New York City.

their victims, but in direct connection with the occupations that give rise to them. It is not enough that employees who have contracted occupational diseases submit themselves to examination and treatment; other employees in the same trades who have not yet contracted the diseases must be examined, and all must be induced to furnish full information, not only in regard to the places and conditions under which they work, but also in regard to their homes and habits of life. It is not enough for employers to send employees who require treatment to company physicians; they must also grant free access to their plants and permit periodical physical examinations to be made of all their employees, both well and ill. Finally, to bring physicians, employees, and employers together in a united effort to lessen the ravages of occupational diseases, the zeal and enthusiasm of social workers are required. As in the case of tuberculosis, itself to some extent an occupational disease, so for occupational diseases generally, the road to reform lies through a vigorous campaign of public education. Social workers must be counted upon to organize this campaign and to press it on to a successful issue.

A comparison of conditions in the United States with conditions in Germany and in the United Kingdom indicates how far we are behind those countries from the point of view of public appreciation of the importance of industrial hygiene. In introducing the system of obligatory illness insurance for wage-earners in 1883 and requiring employers to contribute one-third of the necessary premiums, Germany made industrial hygiene thenceforth a matter of supreme concern to her industrial classes. Preventing occupational diseases was changed from the interest of a few unusually humane or unusually far-sighted employers to a pursuit in which the most mercenary and penny-wise were almost equally zealous. Reducing the number of employees to fall ill and the number of days of illness for those who could not be kept well, now meant reducing sick-insurance premiums and thus adding directly to the year's profits. Whatever may be thought of incidental effects of the compulsory insurance system, there can be no doubt that the wonderful progress that Germany has made in the last thirty years in the field of preventive medicine has been largely due to this bold policy of the Iron Chancellor.

The United Kingdom, in adding in 1906 to industrial accidents

certain specified industrial diseases as grounds on which wage-earners suffering a loss of earning power might demand compensation from their employers, went even further than Germany. Under this plan the employer had to pay, not merely one-third of the premiums out of which indemnities should go to wage-earners, but the whole indemnity prescribed by the law. The list of occupational diseases has been steadily expanded since the law was first passed, until now more than a score are included; and as regards these diseases, it will readily be believed, the British employer has become the eager coworker with the sanitarian in trying to lessen in every possible way the risk to which his employees are exposed. The National Illness and Unemployment Insurance Law, which comes into operation next month, gives the British employer an interest equal to that of his German colleague in reducing all forms of illness. It is no doubt unfair, as well as unkind, to British physicians to ascribe their opposition to certain features of this law to a fear that it will put them out of business; but it is certain that in England, as in Germany, the new policy will give a tremendous impetus to preventive medicine.

In the United States illness insurance, even through sick-benefit societies, is as yet little developed. Even without it, it is probably true that on strict financial grounds it is worth while for the American employer to give greater attention than is customary to keeping his employees well and strong; but for employers in our big cities, with large reserve forces of labor to draw on, the proposition is debatable. It is, therefore, essential that social workers cooperate with physicians in trying to induce employers, on grounds of humanity, or self-interest, or both, to do their indispensable part in furthering the cause of industrial hygiene. Social workers must also rouse employees to an appreciation of the risks they run in unhealthful occupations and induce them, not only to demand safer conditions, but to give the attention to personal hygiene that is now so commonly lacking.

In preference to elaborating further on the subject in general terms, I prefer to illustrate the need of cooperation in promoting industrial hygiene by describing some of the work in which the American Association for Labor Legislation has been concerned since its organization six years ago. Its founders early recognized that industrial hygiene was one of our great national needs. How

to impress this view on a busy and indifferent public was the problem. It happened that the European sections of the Association had recently been giving much attention to the prohibition of the use of poisonous phosphorus in the manufacture of matches, and that European governments had even made treaties for their mutual protection on this subject. Poisonous phosphorus thus seemed a promising industrial poison with which to begin our campaign.

When Dr. Andrews, the secretary of the Association, began his investigation of the match industry for the federal Bureau of Labor, phosphorus necrosis, "phossy-jaw", was a disease of which it is safe to say few laymen in the United States outside of match factories had ever heard, and which few physicians had ever had occasion to diagnose. His first task was to satisfy himself that this disease was one of the necessary by-products of the manufacture of poisonous matches in the United States, as it was acknowledged to be in Europe; his second, to convince an influential body of public opinion that such a dangerous, loathsome, and unnecessary disease ought to be stamped out here by prohibitive legislation, as it had been stamped out by the other civilized nations of the world. Without the cooperation of employers, employees, and physicians, his investigation must have proved a failure. I need not now detail the steps by which it was made a success, nor the two years' campaign waged by the American Association for Labor Legislation which culminated last April in the enactment of the Hughes-Esch Law imposing a prohibitive tax on poisonous phosphorus matches manufactured in the United States after July 1, 1913. Suffice to say that but for the cooperation of the majority of the match manufacturers in agreeing not to oppose the bill, on condition that it should apply to all of them alike and that it should include the prohibition of the importation of poisonous phosphorus matches, the act probably would not have been passed. Further, but for the cooperation of physicians and hospital authorities in supplying evidence of cases of phosphorus necrosis and of the ineffectiveness of preventive measures falling short of outright prohibition, the public could not have been aroused as it was against this evil. Finally, but for the aid of match workers, one of whom went to Washington to display his cruelly disfigured face to the members of the Ways and Means Committee for the sake of his fellow workers exposed to a similar fate, those gentlemen would not have reported out the bill, which had so long been held in committee.

The issue presented by the use of poisonous phosphorus in the American match industry was simpler and more clear-cut than that found in connection with any other industrial poison. Usually preventive measures, not outright prohibition, are the remedies to be sought, and usually there is great difference of opinion as to what preventive measures are best and how they may best be made effective.

Appreciating the need of further information about occupational diseases, the Association has been responsible for the introduction and enactment by eight states in the last two years of bills requiring physicians to report certain specified industrial diseases to designated state authorities, usually the state commissioner of labor. Legislatures are only too ready to pass bills imposing duties upon physicians! It was another matter to devise machinery to insure that reports of value would be sent in and that the statistics so secured would be turned to useful account.

Partly for this purpose and partly to promote industrial hygiene in other ways, the New York Association for Labor Legislation, on the initiative of its secretary, Mr. Paul Kennaday, organized last October, in conjunction with the New York Academy of Medicine, a joint committee on industrial diseases. Dr. W. Gilman Thompson has been from the first the guiding spirit of this committee, and its frequent evening meetings at his house have already resulted in achievements which promise much for its future usefulness. It was felt by all that the first work of the committee should be to try to make the law requiring the reporting of industrial diseases more effective. Dr. Hatch, statistician of the department of labor, was asked to be a member of the committee. He gladly accepted the offer of the committee to cooperate with him in drawing up a more satisfactory form for the reporting of occupational diseases than the department had been using. A much improved reporting blank was finally agreed upon, and this blank is now not only in use in New York, but is likely to be adopted by other states which require occupational disease reports. To impress upon physicians the importance of cooperating with the state authorities in the efforts to collect adequate statistics of occupational diseases, the committee next undertook the compilation of a pamphlet on the nomenclature of occupational diseases, which is to be printed and circulated by the department of labor to all of the physicians in the state.

The services of Dr. E. E. Pratt were then secured to make a report on all the investigations of occupational diseases that had up to that time been undertaken in New York State. With this report as a guide, the committee advised the special Factory Investigating Commission of this state as to the occupational diseases most likely to repay further investigation. The other work undertaken by the commission is so broad that the attention it can devote to occupational diseases has proved to be disappointingly slight, but it has asked the cooperation of the committee in framing recommendations to the state legislature for the creation of a permanent bureau for the study of occupational diseases, and with the constantly growing interest in the subject there is strong likelihood that such a recommendation will be acted upon favorably.

Besides these more important activities, the committee has served as a clearing-house of information for numerous other groups interested from other points of view in the general subject of industrial hygiene. For example, it has met with the committee on industrial poisons of the Chemists' Club of New York City and discussed possible lines of cooperation during the coming winter. It is the purpose of this committee, so soon as the necessary funds are secured, to prosecute investigations of the numerous occupational diseases that have not thus far received adequate attention. Its members, through articles and addresses to all sorts of audiences, are constantly urging the importance of greater attention to industrial hygiene. Also through its members it hopes to induce some employers voluntarily to introduce the precautionary measures that its investigations and the investigations of others prove to be desirable. So soon as the practicability and efficacy of these measures shall have been demonstrated, the Association for Labor Legislation will seek to have their introduction made mandatory through labor laws, so that the lives and health of all employees may be protected.

Our experience in New York has convinced us that the organization of a committee of physicians, sanitarians, and interested laymen, such as I have described, is an important, if not a necessary, aid to effective work for industrial hygiene. Physicians and sanitarians must supply the expert knowledge, but for the most part they are too busy to direct the work of educating public opinion or of shaping the legislation which this knowledge proves to be necessary. This

part of the task must devolve mainly on social workers. In addition, industrial chemists, representatives of life insurance companies, and officials of the appropriate departments of the city and state governments, may be drawn in to form a group which is representative of enlightened and progressive public opinion touching this problem. Through such a group tasks can easily be accomplished that would be impossible for men working in isolation, or even for the associated members of any single profession.

We recommend the organization of similar committees in other states as an efficient means of advancing the cause which we all have at heart.

GENERAL DISCUSSION

DR. WARREN COLEMAN, *Bellevue Hospital, New York City*: In view of the importance of the subject of industrial diseases, may I be permitted to suggest that a petition be presented from this section to the House of Delegates of the American Medical Association requesting the appointment of a committee to cooperate with the American Association for Labor Legislation to promote the study of industrial diseases.

This motion was duly seconded and unanimously carried.

DR. ROSALIE SLAUGHTER MORTON, *New York City*: I have been especially interested in this joint session. It seems a great evidence of progress that the laity and the profession of medicine should get together to work for the public good. The work done by the Association for Labor Legislation has gone so far that I, as vice-president of the Medical Section, feel it an honor to cooperate with you.

DR. C. F. STOKES, *Surgeon General, United States Navy, Washington, D. C.*: We have been looking after occupational diseases in the Navy, but entirely on the basis of military efficiency. There is no humanitarian factor in it. Sanitation generally has reached a satisfactory condition. But in a battleship we find grouped together a more varied set of activities than will be found elsewhere in the same space.

Respecting the eye troubles, the men who adjust arc-lights have severe troubles caused by the sudden glare. In our turrets, too, we have our gun pointer, the man who points the guns; the range is so long that he must use a telescope, and we have found that these men, who started in with normal vision, have dropped down to eight and ten below. That is something which is very important to the Navy.

Then there are the toxic gases. We find in almost all these great ships a type of gas which has caused death in many instances, happily in foreign navies. The element at work seems to be a diminution of oxygen. After two or three rounds at battle practice, the carbon dioxid runs up to forty. We have powder gas at work there which gives us a carbon monoxid poison. Men who have at the

beginning of firing a pulse rate of seventy-two, have at the end of ten minutes a pulse rate of one hundred and twenty. And in the fire rooms the heat prostrations are due largely to gas contamination, carbon monoxid. The same thing applies to submarines. We have been working at this gas problem.

I was interested in what Dr. Dana had to say. It is now known that there were some two thousand men at Port Arthur during the Russian-Japanese War who were invalided home by reason of insanity. In other words, they were not temperamentally fit for that hazardous work. We find that some men get along very well during peace times but, when it comes to battle practice, or possibly to some great hazard, they break down. They are temperamentally unfit. These are all military considerations bearing on occupational hygiene.

DR. MARK D. STEVENSON, *Akron, Ohio*: Occupational eye diseases may be caused by exposure to excessive light or heat, to poisonous gases or fumes, and by prolonged and peculiar strain.

First are diseases due to excessive light or heat, e. g., in electric welders, steel smelters, and in those who melt or anneal glass. Metal polishers and buffers, brightening surfaces which they must closely watch, often suffer with hyperesthesia of the retina. This can be relieved by proper lenses or colored glasses. Excessive heat and light are met with in iron and steel works. Men can watch a furnace until the temperature is up to 2000° F., but before it gets to 3000° colored glasses should be worn. If some of these hot furnaces are looked into without lenses it is several minutes before the eye can see ordinary objects again. Some men seem to have surprising immunity from bad results in dealing with these white-hot furnaces; others cannot endure them and must change their work. Herbert Parsons and Marcus Gunn, who visited some of the important glass works in England in 1908 to gather statistics of industrial diseases for the framing of the Workmen's Compensation Act, state that bottle workers have a characteristic form of cataract,—typically, a dense, well-defined disk of opacity in the center of the posterior cortex. Excessive heat and bright light are said to be the causes, but the Germans claim that heat is the most important cause. Weyl mentions, besides glass-blowers, fire workers, puddlers, blacksmiths, bakers, and cooks. Great care is required to avoid very strong light

flashes before the eyes, as in short circuits and electric welding. In the latter large shields are worn, in the center of which are four alternate layers of blue and red glass. Helmets and screens, with four or six layers of red and green glass, are often used. The temperature in electric welding goes as high as 7000° F., but the question of whether it is the heat or the chemical rays that act so harmfully has not been settled. If the eyes catch the light they are affected at once, but usually the effect appears some hours afterwards. The eyes feel swollen as if filled with burning sand and the pain is usually severe; the lids are swollen and there is much lachrimation.

Other diseases are due to working in certain poisonous gases, fumes, dusts, or substances, such as bisulfids of carbon, lead, etc. Dinitrobenzol is largely employed in making explosives. During the various processes of its manufacture fumes are given off which affect vision. These can be lessened by properly covering the mixtures and by the use of fans and exhaust apparatus. Respirators and glasses should be used. Bisulfid of carbon, formerly much used in vulcanizing rubber, caused impaired eyesight, but this process has been so greatly modified that it is now of little importance in causing ocular lesions. Toxic amblyopias, due to tobacco, ethyl alcohol and wood-alcohol, are too well known to require consideration. The eye affections formerly attending the manufacture of iodoform have by care been eliminated. A few cases of eye involvement have been reported in dye factories from handling the various coal-tar preparations. Arsenic and paris green from wall-paper, artificial flowers, paper hangings and paintings, have caused various visual disturbances. Painters, plumbers, electrotypers, file-cutters and many others, through handling lead, are likely to get chronic lead poisoning, causing central and peripheral affections of sight, various paralyses, retrobulbar neuritis, etc. Poisonous gases and fumes are also formed in certain lead processes, and in shoe cement, japanned or patent leather, and rubber manufacturing, where the mixtures containing naphtha are sometimes allowed to remain in uncovered containers and proper ventilation is not insisted upon.

Eye diseases may also be due to occupations requiring prolonged and peculiar use of the eyes, e. g., nystagmus in miners, which is due to their peculiar way of looking at their work. Treatment consists in changing the kind of work. After relief the miner can

return to his work if the head can be kept straight and the eyes are not often turned upward. Snell mentions several other occupations which he has thought might cause nystagmus, because the eyes were turned directly or obliquely upward.

DR. WALTER F. DUTTON, *Carnegie, Pa.*: The occupational disease which results from the manufacture of vanadium is not as yet well known. There are two reduction plants in the United States, in which there are a number of employees. The products are being used more and more in the manufacture of steel, in photography, and in manufacturing plants where mordants are used. The monoxid is used in photography; the dioxid in printing calicoes, and the trioxids in the manufacture of steel. This disease will become more and more well known as the use of vanadium products increases. I should like to call your attention to an article in the *Journal of the American Medical Association* of June 3, 1911.

MR. E. C. CURTIS, *New York City*: Speaking for the men who work in compressed air, I think we need very much the cooperation of physicians and of the American Association for Labor Legislation to better our condition. Up to the present time the doctors have not attended to this industry as they should. There were 3692 cases of compressed-air illness in one small job, the East River Tunnel. I have known personally of men who have entered these air-locks without the doctor ever looking at them; there were small boys who acted as doctors and passed the men to go into the caissons. We had one case in particular where we ought to get a conviction; we went before the doctor proving that the man was sent down with an abscess on his neck, and was dead before he got half way down. That is one of the conditions under which the men I represent are compelled to suffer, and I claim there is carelessness among the doctors. We had another case only recently, where a man was put into the medical air-lock while a new invention was being tried on him. They put him into cold air. The man was frozen to death in the medical air, taken out of there and laid for three solid hours on a plank, and then brought home dead. The physicians do not seem to value human life at all. Here was a man with six children brought home dead for experimental purposes. But if the physicians are going to be sincere in this matter, and the American Association for Labor Legislation and the American Medical Association will

work together, it is going to be a great help to the men in the industry I represent.

MRS. HENSON: With regard to the point just brought out, the workmen ought to know, and they do know if they stop to think about it, that physicians are better paid by the corporations. They should take this point close to heart and get after the remedy. Until the workmen own the industries, and therefore are the employers of the physicians, they will never be certain of the best service. Lest some may not have read enough of Socialism to know what I mean, they must establish the cooperative commonwealth.

DR. ALLEN STARR, *New York City*: I wish to say a word about a matter which does not seem to have been brought out in the discussion,—the necessity for informing the individual laborer of his dangers and of the means for their avoidance. It seems to me that the American Federation of Labor can do a great work by insisting in its labor unions upon certain definite information being given to each laborer, in his own department, as to the methods of avoiding these dangers, and so preserving his health. If a painter, for example, will take an ordinary piece of newspaper and place it between his sandwich and his fingers, he will not get the lead from his fingers into his mouth. Yet in a large clinic in New York last year I questioned thirty individuals suffering from lead poisoning in regard to whether any instructions had been given them, by their employers through notices posted in the factories, or in their labor unions, as to methods of avoiding lead poisoning, and found that they had never heard even of a simple device of that kind.

Many of these cases of disease, too, are the result of carelessness. I have had some experience with the caisson disease, which the gentleman from New York has alluded to. One of the most competent engineers in the employ of the Pennsylvania Railroad Company insisted on disregarding the precautions he should have known and was careless enough to come out from a tunnel without spending enough time in the various compartments. I should like to know if these men are not instructed about the necessity of remaining in the compartments a certain length of time, and whether their injuries have not resulted from carelessness.

I should also like to make one other point in defense of the manu-

facturer. I have a large acquaintance with important manufacturers in New York State, but I have yet to find one, of a reasonable degree of intelligence, who is not as much interested, from his standpoint, as the laborer is from his. I will cite one company in Jersey City which put up a factory in which incidentally there is a large amount of dust discharged into the air. This company spent \$40,000, under the direction of an incompetent engineer or architect, for a system of ventilation by which the dust was taken up to the top of the room, passing on its way the mouths of the operatives. One intelligent operative came to the head of the firm, a personal friend of mine, and said: "That is a defect; if you would put your exhaust apparatus in the side of the floor, gravitation would take the dust down and we would not breathe it in." That gentleman had the good sense and the philanthropic instinct developed, and he changed the whole system and spent \$20,000 more in installing a new apparatus.

I believe there is great hope along these lines of disseminating information,—first, information to the employer as to what is the necessary thing for him to do, and secondly information to the employee as to personal methods of protection. And that, it seems to me, devolves more upon the Association for Labor Legislation than it does upon us physicians.

DR. GEIER, *Cincinnati*: I wish to disagree with the last speaker when he states that you must approach the employer from the humanitarian standpoint. I have had some experience with employers in Cincinnati in the tuberculosis problem. You don't need to use the cry of humanity at all. They prefer to have you come in with a business proposition. It is perfectly possible to go to them and say: "You are doing this and that and the other thing and you are losing this and that, so many hours loss and so much inefficiency; put in this device for sanitation and ventilation and you will make from one to twenty per cent in the increased efficiency of your employees." That is the thing that is bound to appeal to the business man. As a trimming on the side we may speak of the humanitarian work; but we must approach the business man with a business proposition.

In Cincinnati there is a factory which is ready to pay \$2500 to \$3000 a year to a physician to come in and advise them and examine

their operatives, etc. I have been asked to find such a man. As a matter of fact I do not know one man in Cincinnati, who is not earning \$5,000, \$6,000, or \$10,000, who has the proper sociological view to fill that position.

DR. CHARLES E. BREST, *Waterford, N. Y.*: For some twelve years I pointed my practice to preventive medicine. It naturally brought me into the shops and into contact with employers, and I barked up the humanitarian tree for four or five years. I looked up statistics in regard to the mortality among employees in certain rooms where the air was the same air as when the walls of the building were put up, and presented them to the employers. But up to the good times of a few years ago, when it was difficult to get trained employees, they derided me, and there is nothing more difficult to stand than ridicule. At that time, however, I demonstrated that it is an expensive proposition to develop skilled employees and then lose them absolutely, and that it is good policy to care for them. Employers close down for a week every year to fix up the machinery; they never think of doing that for the employee. But when I put it as a business proposition the employers were willing to see the point, and they came to me, not only in cotton mills, but in laundries. I thoroughly agree with the gentleman from Cincinnati. If you present the proposition to any manufacturer who is trying to make good with his work he will cooperate with you.

PROFESSOR HENRY R. SEAGER, *President, American Association for Labor Legislation, New York City*: Some one has said that the first work of science is classification. From that point of view it would be impossible to exaggerate the importance of Dr. Thompson's paper. The other papers give point to the suggestions which he has made, since they deal, most of them, with specific occupational diseases. We are especially glad to have evidence from the men who must know what the occupational hazards really are.

As a business proposition to employers, as a line of least resistance, I am afraid, when we consider the employer in a large city and his mass of unskilled labor, that those of us who are conscientious would not have the face to go before an employer and tell him that it would be profitable to look after the health of this man who is taken ill and turned off, for some one else can be taken on in his

place without much expense and with little trouble. But by all means let us, wherever possible, approach the problem from the point of view of business. I do not regard that as optimistic. It seems to me those who approach the problem from the humanitarian point of view are the more optimistic.

DR. A. M. HARVEY, *Chicago*: As one of the chief duties of the physician is to prevent disease and preserve health, it is indeed gratifying to attend a joint meeting of physicians and members of an Association which is interested in proposing legislation for the protection of the health of workers. We need a great deal more knowledge of the subject of occupational diseases before proper laws can be proposed and enacted. Nothing should be done hastily, for we undoubtedly have too many laws now on our books that are not enforced.

I believe that one of the chief things that can be done to prevent occupational disease is to limit the age at which children may go to work, and another is to limit the hours of work so that the worker may recover from the fatigue incident to his labor. My experience with workers during the past sixteen years has shown me that many diseases may be prevented by proper elimination of dusts and noxious gases and by proper ventilation and lighting of workshops.

As all speakers have said, a great deal can be done by cooperation, but I think we have left out one class of organizations with which we should cooperate, the manufacturers' associations of the various states. In Illinois we have an influential manufacturers' association, and I think it would be very easy to induce it and other similar associations to take up the work as outlined in this symposium. I know that many of the larger manufacturers in Illinois have maintained health departments for years, have a great deal of data for which you have been asking, and would do a good deal toward preventing disease. Many of our manufacturers have taken an interest both from the humanitarian standpoint and from the economic standpoint, because they know it is hard to get skilled workers and that it is cheaper to prevent than to cure.

MRS. FLORENCE KELLEY, *National Consumers' League, New York City*: As a layman I have listened to the papers of the morning with the very greatest interest and I should not venture to criticize the

medical statements. But Dr. Edsall ventured into my own field when he suggested that we should not be hasty or drastic in drafting bills for the protection of working people lest the manufacturer move from one state to another. Manufacturers do not move from one state to another to escape legislation for the protection of working people. Our legislation is very halting and faulty compared with that of Europe, and its enactment is always accompanied by threats of removal from manufacturers.

Since May, 1889, I have been looking for the manufacturer who actually moves to escape such laws. For four years I was head of the state factory inspection of Illinois. The Illinois Glass Company of Alton made the most ominous threats in order to escape the enforcement of the child labor law enacted in 1893. We found two hundred and ninety-six violations of that law and made it clear that children under fourteen must be dismissed, that children under sixteen must not work at night, and that all children must have the certificates required by law. The threat has been renewed by that company at every amendment to the statute. But the company has not moved. It has stayed where it was and has multiplied its staff and plant by three in the intervening years.

I did once appear to have come upon a case in which a textile mill had moved from Massachusetts to Rhode Island in consequence of an amendment which made the laws for the protection of women and children more drastic. When I hunted it up I found that the company was desirous of establishing new and entirely modern, up-to-date plants simultaneously in one of the southern states and in New England. It received from the village to which it went in Rhode Island the gift of right to the land and valuable concessions in regard to water power. Its removal has been used as an argument against improved legislation in Rhode Island and Massachusetts; but no one, not even the manufacturers themselves, could clearly disentangle the influence of a slightly increased rigidity in the laws regulating the employment of children from the gift of land and lasting concessions of water power.

We want uniformity, but we don't want to let uniformity become such a bugaboo that we are afraid to do anything for fear a state may cease to be uniformly bad with the other states. I challenge anyone here, and I have been challenging anyone from whom I had any hopes of enlightenment for twenty-three years, to produce an

authentic case of the removal of a manufacturer from one state to another because of the protection of the workingman.

MR. MILES M. DAWSON, *New York City*: I feel as if I were taking the position Scipio Africanus is said to have taken before the Roman Senate, "Carthage must be destroyed", when I arise to speak concerning the intimate and necessary relations between the various branches of the work we are unfolding and starting in the United States. We can never accomplish what we wish in the matter of industrial hygiene and the prevention of industrial diseases until we have throughout the United States a system of compulsory sick insurance. The statement made by the lady who spoke of the necessity for the workman being interested in the employment of the physician, whatever we may think about her general conclusion, is justifiable. The physicians have not given the caisson sickness proper attention. We need in the United States something which will take care of our people and we shall not be able to do it effectively until they are obliged to have sickness insurance.

PROFESSOR SAMUEL McCUNE LINDSAY, *Columbia University, New York City*: In view of the fact that every speaker has confessed that our ignorance of occupational diseases is so great that any legislation at present would be hasty, we are likely to have hasty and ill-considered legislation. But there are some kinds of legislation we are now ready for, and it is important that, at this joint meeting of the Medical and Labor Legislation Associations, we should turn our thought to the kind of legislation for which we are ready.

I shall pass over the sort of legislation that has resulted so satisfactorily in the prevention of phosphorus poisoning, where our knowledge was a little further advanced than in regard to other kinds of industrial poisoning. We need authoritative information and, as has been suggested by several speakers, we are all agreed that such information can be had, in the last analysis, only with the co-operation and support of the state. In other words, we must secure legislation in several states that will set to work the machinery we need to get that information. I have just returned from Washington, where I have been in connection with the work of the committee which has undertaken to urge the passage of a bill providing

for an impartial national commission to inquire into all the relations between employers and employees. Such a commission, I take it, would properly bring within the scope of its inquiry the subject we are discussing. That measure should have the support of all here present.

Reference was made by one of the speakers to the disagreeable feature of reporting cases of industrial disease, the burden on the physician. I think the gentleman suggested that he had a little doubt about the advantage of these laws. But it ought to be pointed out that the use of such a schedule as that of the bureau of labor of New York will have a good effect. It will call the physician's attention to the industrial side of the health problem and will have a value in his work which will make the burden not without its reward. At any rate, it seems to me that this is a type of legislation for which we are ready, and that the American Association for Labor Legislation is justified in pushing its campaign to have reporting laws passed in all the great states.

II

INVESTIGATION OF INDUSTRIAL DISEASES

Presiding Officer: HENRY R. SEAGER

President, American Association for Labor Legislation

NEW YORK CITY

INTENSIVE INVESTIGATIONS IN INDUSTRIAL HYGIENE

FREDERICK L. HOFFMAN
Statistician, Prudential Insurance Company.

Industrial hygiene is gradually assuming the position of an applied science in its relation to government and the public at large. The nation-wide agitation for effective workmen's compensation legislation and the establishment of state insurance for this purpose in Washington, Ohio, and Massachusetts, emphasizes the necessity for trustworthy information, statistical or otherwise, with regard to the whole question of health and safety in American industry. It is not going too far to say that most of the published information on the subject of industrial hygiene and industrial accidents is of very limited practical value, and much of it is decidedly misleading.

There have been very few intensive studies of the actual conditions under which American industry is carried on at the present time. In the memorial to the President on the appointment of a national commission for the investigation of industrial diseases, practically all the conclusive evidence was derived from foreign sources or intensive and more or less conclusive investigations made in foreign countries. It is most encouraging, however, that within recent years the necessity for such investigations should have been recognized, and mention only requires to be made of what has been done in this respect by the states of Massachusetts, New York, Illinois, etc. The honor belongs to the state of Illinois for having been the first to appoint a special commission to investigate and report upon the subject of industrial diseases, and the report of that commission constitutes a valuable contribution to the literature of industrial hygiene. The publications of the Massachusetts State Board of Health, and of the New York State Department of Labor require also to be mentioned as helpful indications of the direction which in years to come investigations of this kind are bound to take to an increasing extent. The monograph by Dr. Andrews on phosphorus poisoning and the reports by Dr. Hamilton on lead poisoning

are epoch-making documents which separate precisely the field of guesswork opinion from the field of impartially ascertained facts.

The principles which underlie all investigations of this kind are not as yet fully defined. It may be said at the outset, however, that every industry should be inquired into with reference to the health and safety of persons employed therein, but with a due regard to the essential conditions under which such industries can be economically, profitably, and efficiently carried on. It is important in all investigations of this kind that the investigator first make himself thoroughly familiar with the technique of the industry or trade about to be investigated, since whatsoever conclusions may be arrived at, they must be more or less conditioned by the elements of the industry itself. A clear understanding of the technical details of any given industry or trade often requires much patient study and research, but without such an understanding of the methods by which a particular industry or trade is carried on most of the conclusions as to health and safety must be more or less wanting in the essential requirements of absolute accuracy and impartiality.

It is unfortunate for research in the field of American industrial hygiene that most of the textbooks descriptive of industrial or manufacturing processes should be by foreign authorities, just as is the case with regard to textbooks on occupational diseases and the prevention of accidents. Some notable exceptions are the standard works of reference on metallurgical processes and industrial chemistry. The treatise on *Industrial Organic Chemistry* by Sadtler, and the *Outlines of Industrial Chemistry* by Thorp, are indispensable to research work in a large number of industries chiefly or partly inclusive of chemical processes of manufacture. The earlier *Dictionary of Arts, Manufactures, and Mines* by Ure, in three volumes, and the still earlier *Cyclopedia of Useful Arts* by Tomlinson, and *Chambers' Information for the People*, published in 1847, are useful for the purpose of illustrating the methods and processes of manufacture in the past. Some of the descriptive accounts of industrial processes published by the Census Office from time to time since 1880 are of considerable practical value in investigations of this kind, but it is much to be regretted that there should not be a popular treatise on the technology of trades and industries giving, at least in brief outline, an intelligent account of modern methods of manufacture, with particular reference to the safety and health of the employees, and including the smaller, but frequently more important trades.

As illustrations of the textbooks useful for the purpose of obtaining a sound preliminary understanding of the essential factors in industry, I may refer to the treatise on *The Manufacture and Properties of Iron and Steel*, by Campbell; *Modern Copper Smelting*, by Peters; *The Textbook of Ore-Dressing*, by Richards; and *Lead and Zinc Pigments*, by Holley. For many of the industries excellent monographs have been published by corporations which, by their illustrations alone, render substantial aid to the students of industrial processes in their relation to health and life. I may refer to a short treatise on *The Destructive Distillation of Bituminous Coal*, with reference to the United-Otto system of by-product coke ovens, which practically constitutes a guide to that rather intricate process which has made the utilization of valuable waste products a commercial possibility. The federal and state geological surveys publish reports which frequently contain interesting observations and suggestive illustrations, but I can only refer to the report of the geological survey of the State of New York on the lime and cement industries of that state, and to the report on the manufacture of roofing tiles, published by the geological survey of Ohio.

Next to a sound technical foundation it is of some importance that the historical facts of any given industry be taken into account, and while the history of American manufactures has not been brought down to date, Bishop's classical work is still of value, monographs are occasionally printed by institutions of learning, and the report on manufacturing industries by the Census Office also contains much useful information. I can only refer to the excellent monograph on *The Printers*, by Professor Barnett, published by the American Economic Association, and to the historical account of the English tin miners, by Lewis, published in the series of Harvard Economic Studies.

The most useful sources of information with regard to industrial processes are the technical trade journals, which for practically all of the industries extend over a considerable period of time. These publications, to an increasing extent, take into account the economic and social conditions of labor, and with special regard to wages, hours of labor, etc. The reports and bulletins of the federal Bureau of Labor and of the state departments of labor, moreover, make an immense amount of more or less trustworthy information conveniently available. Such reports of the federal Bureau of Labor as

have recently been published on the steel industry, and the series of reports on the condition of women and children, emphasize important elements of inquiry which require to be taken into account.

It is the disregard of this necessity for preliminary education which usually accounts for failure to secure the best possible results. Intensive industrial investigations are a burden upon industry and they should be made only by those qualified for the task, and by men or women thoroughly trained *in advance* with regard to all the facts and conditions which they can ascertain from existing sources of information. Industry does not exist for the purpose of providing material for the writing of books or descriptive monographs, but solely for purposes of production at a rate of profit consistent with safe and economical management. The large majority of manufacturers throughout the United States are deserving of unstinted praise for the manner in which their establishments are conducted and made to conform to legal and moral requirements with regard to the safety, health, and comfort of employees. The difficulty is not so much in what is obvious as in what is *not* obvious. Immense progress has been made and the tendency practically everywhere is decidedly toward betterment consistent with the conditions under which industry can be profitably carried on.

The problem is one of ignorance rather than of neglect. Most of the factors which condition health and safety in industry are as yet very imperfectly understood, at least in the United States. It is true that within the last quarter of a century immense progress has been made in Germany, but largely because of the requirements of compulsory accident insurance institutions established to replace an antiquated system of employers' liability law. We have not as yet developed in this country the function of the safety engineer, who has attained to such high professional standing throughout the German Empire because of the practical utility of his services. Manufacturers or employers of labor generally are not blamable for their reluctance to install expensive safety devices, or ventilating devices, or other methods or means by which health, safety, and comfort can be improved, unless the evidence is conclusive that the investment will be productive of the desired results. The function of the ventilating engineer in his relation to industrial requirements is practically new, and almost the same may be said of the function of the illuminating engineer. All of these questions require to be

taken into account by the critic of industrial conditions in so far as they have relation to the safety, health, and comfort of the employees.

A manufacturing plant is private property and admission thereto obtained by visitors or investigators is a matter of courtesy on the part of the corporation or firm. All manufacturing establishments are subject to the visitorial powers and duties of state labor bureaus, or state factory inspection bureaus, and to a certain extent of state boards of health. The inspectors of these respective governmental departments are free to make their investigations without let or hindrance, and their conclusions, so far as practicable, should be made public as a matter of record. Until, however, the status of the factory inspector, or the health inspector, is raised to the dignity and far-reaching responsibility inherent in the position, it is self-evident that radical conclusions must be accepted with caution, and exceedingly favorable reports must be looked upon with more or less distrust. It is not going too far to say that most of the published reports of factory inspectors in this country are of very limited practical utility for research work in the field of industrial hygiene; while, in marked contrast, the annual reports of the chief factory inspectors of England, Germany, Austria, France, Switzerland, Belgium, etc., are models of their kind and trustworthy sources of information with regard to conditions more or less detrimental to health and life in industry.

The investigator, having obtained permission, as a matter of courtesy, to visit an industrial establishment, should refrain from any conversation with the employees except by the specific permission of the employer. A labor force, under the best conditions, is easily disturbed by the visits of strangers, and most of all by men or women who are supposed to be in search of information or facts more or less detrimental to the industry investigated. There are everywhere employees with grievances, whose evidence may be given in good faith, but who cannot be relied upon in matters of fact. The investigator should be a trained observer and should take notes at the time of inspection of everything seen or heard which has any possible bearing upon the purpose of the investigation—that is, whether conditions exist which are a menace to the safety and health of the employee.

The investigator must keep in mind that employers of labor who

have given years to the operation of a particular plant, possibly representative of extremely complex methods of manufacture, are not likely to be indifferent to the desirability that the best possible conditions of work be maintained. At the same time it quite frequently happens that the most obvious need escapes attention, since the mind of the employer is preoccupied with matters of more immediate personal concern. Every manufacturer or employer of labor welcomes intelligent, concrete suggestions as to methods and means by which the conditions affecting the health and safety of his employees can be materially improved. The investigator may safely take it for granted that, broadly speaking, the manufacturer or employer is as much interested in the ascertainment of the truth regarding actual conditions as the outside public or the investigator himself. He is fully assured of the most hearty co-operation in the large majority of cases in which intensive investigations are made under proper conditions and by thoroughly qualified persons fit to go into delicate matters of this kind.

The information obtained may be considered confidential or not, according to the previous understanding with the manufacturer or employer whose particular plant has been made the subject of an inquiry. As a rule, there should be a precise agreement on this point, and if a written report is made a copy thereof should be sent to the manufacturer or employer for verification or for such comments as misstatements or errors in matters of fact may require.

It is hardly possible, on an occasion of this kind, to enumerate all of the factors which should be taken into account. It requires no discussion to prove that such problems as air conditioning in textile mills, the mechanical properties of industrial dust or the effective removal of such dust by ventilating devices, the alleged pathogenic properties of mine air, or the injurious effect of intense light in electro-metallurgical processes, all demand special and highly technical qualifications for the rendering of a judgment or opinion that may be relied upon as sound. But with regard to most of the conditions which injuriously affect the health of employees, or which have a relation to the employees' safety as conditioned by safety devices, ordinary intelligence, plus the power of intelligent observation, is sufficient. But granting this, an intensive industrial investigation is a difficult task, than which perhaps no public function requires to be approached with more genuine humility and diffidence.

It is not a difficult matter to conceive of ideal conditions of work, and most of all is it easy to condemn the employer and relieve the employee of all responsibility. But it requires a trained mind to ascertain the necessary facts and to draw conclusions which can be practically applied to the more or less apparent needs for drastic reform. Investigations of this kind are laborious and should not be undertaken by those who are easily fatigued or confused.

The sole object in view is to ascertain the truth and to ameliorate, as far as possible, the conditions of labor, so that those who are the real producers of the nation may not pay the price of industry in an excessive amount of disease or premature invalidity and death. There is no more useful function in society than that of the earnest seeker after truth in matters of this kind, and there is nothing more creditable to any nation than actual progress in industrial hygiene and the prevention of needless industrial accidents. On a very conservative basis, twenty-five thousand lives are annually lost in the United States as the result of industrial accidents, which is the tribute paid in lives by some thirty million toilers who carry on the nation's work. What the tribute is in ill health and invalidity no one is at present in a position to estimate even with approximate accuracy upon the slender basis of data available. But granting that the relative occurrence of industrial disease is greater in Germany than in this country, and taking only half the calculated amount of sickness on the German basis, the figures are as startling as they are suggestive of the imperative need for the most patient, the most disinterested, but at the same time the best qualified methods of research in industrial hygiene.

It requires no argument, therefore, to emphasize the need for a thorough understanding of the essential facts of industrial hygiene as a preliminary requisite for intensive investigations into the conditions inimical to health and life in industry. The historical method has obvious advantages in that it brings out with reasonable accuracy the progress which has been made by the complete elimination of some of the worst conditions injurious to the health of wage-earners in the past. The treatise by Ramazzini, published for the first time in English in 1705, is a textbook which may still be consulted to practical advantage, and it is to be hoped that some time this exceedingly rare work will be reprinted. Tissot's *Essay on the Disorders of the People of Fashion, and the Diseases Incident to Literary and*

Sedentary Persons, published in 1772, is also quite suggestive; and the same may be said of Thackrah's treatise on *The Effects of Arts and Professions on Longevity*, published in 1832. There is much valuable information in Gaskell's book on *Artisans and Machinery, and the Moral and Physical Condition of the Manufacturing Population*; but one of the most suggestive works on occupational diseases is *The Vital Statistics of Sheffield*, by Holland, published in 1843. There could be no more serious error than to assume that the health-injurious consequences of occupations are limited to the mechanical industries, and it only requires to be pointed out that the proportionate mortality from tuberculosis of the lungs at ages from twenty-five to thirty-four among salesmen is 46.7 per cent. In 1884 Thomas Sutherst, a barrister-at-law, published a very suggestive work, with numerous cases, on *Death and Disease Behind the Counter*, intended as a protest against the more or less unnatural conditions of shop labor.

These are the earlier works of reference, which have since been partly replaced by the *Handbook on Occupational Diseases*, by Arlidge, followed by the standard work of reference on *Dangerous Trades*, prepared under the editorial supervision of Sir Thomas Oliver, who about two years ago published a compact textbook on *Diseases of Occupation*, which can be consulted to great practical advantage on the group of occupations to which the work is limited. There are a number of German and French textbooks on industrial hygiene which have not their counterpart in English. Foremost among these is the great work prepared under the editorial supervision of Weyl, including observations on the "General Principles of Industrial Hygiene and Factory Legislation" which have for their specific object improvements in conditions affecting safety and health in industry. An excellent manual in German is a treatise on *Industrial Hygiene*, by Holitscher, and there is a book by the same title published in 1906 by Dr. Bender, a medical factory inspector of large experience. Special reference should be made to two small manuals of advice to German boys and girls about to enter a trade, which have particular regard to the physical requirements and the mental adaptation to particular industrial processes. Manuals of this kind, obtainable at a cost of a few cents, convey the required information in the most effective manner, but the suggestions contained therein are also of practical value to the student of industrial hygiene.

Research work on a larger scale is much facilitated by the *Index Catalogue of the Army Medical Museum and Library*, for some of the most useful and instructive discussions of special phases of industrial hygiene and the medical consequences of industrial accidents are the occasional contributions by practicing physicians to the medical periodical press. A thorough study of the available medical literature relating to occupational diseases and occupational neuroses is imperative, for even the most earnest seeker after information may fail of his or her purpose on account of lack of the required preliminary training. As has been previously pointed out, the recent legislation on workmen's compensation and the tendency in the direction of drastic and far-reaching laws make investigations into the field of industrial hygiene and accidents of great practical importance. Those who have had to do with the settlement of *Claims Arising from the Results of Personal Injuries* appreciate the value of a work with this title by Magruder, and of the larger treatise on the *Causes of Disability*, by Harbaugh. A most useful handbook in this connection is Saunders' *Medical Hand Atlas of Diseases Caused by Accidents*.

In brief, the present plea is for scientific methods in intensive investigations in the field of industrial hygiene as a first requirement for the attainment of really useful and conclusive results. Probably no other field of systematic research offers such exceptional opportunities to the earnest seeker after truth, and certainly none is more likely to prove of great benefit to the mass of mankind. In justice to employers, whose every effort to improve conditions inimical to health deserves encouragement, and in equal justice to employees, whose health and well-being are menaced at the present time by conditions more or less unsatisfactory, it is of the utmost importance that so difficult a task should be approached with a due consideration of the seriousness of the problem, the need of a scientific method, and the duty of absolute impartiality. The object of all investigations of this kind is not to prove or sustain any particular conclusion arrived at in advance, but to determine the truth and the facts as they actually exist and as they condition at the present time the health and well-being of the men, women, and young persons employed in productive industries.

COMPULSORY REPORTING BY PHYSICIANS

LEONARD W. HATCH

New York State Department of Labor.

Compulsory reporting of industrial diseases by physicians constitutes the first step in the campaign for prevention, if the latter is to be comprehensive and scientific. It is a case of an extensive evil known to exist in various forms, in divers places, and from a variety of causes, but also known to be in large measure eradicable if only we can discover its various forms, their location, and their causes. If, therefore, preventive efforts are to be directed so that they may be at once comprehensive in scope and intelligently effective in detail, knowledge of the frequency, incidence, and sources of the evil are of prime importance.

Furthermore, it is safe to say that the prevention campaign only awaits the necessary knowledge of the evil to be assured of success. The propriety of the exercise of the police power of the government in the interests of public health, which means the health, not only of all the public, but of any particular portion which may be subject to peculiar health hazards, has long been recognized, and public sentiment was never more quick than now to back laws for such a purpose, while private initiative, stimulated by public sentiment or moved by humanitarian motives, has never inspired greater activity than now along these lines.

If, then, prevention waits only for adequate information, where shall this information be secured? Obviously for information concerning diseases the principal source technically equipped to serve as a reliable informant is the medical profession. Further, it is not essentially a case of calling upon physicians to go out of their particular field of work, because practically all cases of occupational disease, serious enough to be important, come to physicians automatically, so to speak, in the course of their regular professional practise. In this aspect, compulsory reporting of occupational diseases is precisely like compulsory registration of deaths. It is simply the necessary requirement for bringing together by registra-

tion at one place scattered data which come under the eye of different physicians in their regular work. That this registration of industrial diseases is usually to be made with a different department of government than registration of deaths, is due simply to the fact that special government agencies, in the shape of labor departments, have been developed for the safeguarding of the health of workers, just as health boards or departments have been developed for the conservation of the general health of the community. Registration of deaths, being significant for all phases of the public health, goes naturally to the department of government with the broader function. Registration of the diseases of industry goes, likewise naturally, to the department whose special field is health in industry.

But more important than analysis of the fundamental reason for laying upon physicians the obligation of registration of industrial diseases, is consideration of just what kind of information should be asked of them in connection with such registration.

It almost goes without saying, of course, that the first thing to be required in a registration certificate is the strictly professional matter of the physician's diagnosis of the disease. But if registration is to furnish all that is necessary, the physician must be asked to go beyond the narrowly professional function of diagnosis to consideration of antecedent causes of the patient's condition. The importance of the physician's taking this point of view can hardly be overemphasized. It is necessary because, to a large extent, it is the only means by which the physician can discover that diseases are occupational. When we speak of industrial diseases we are not dealing with a class all of which are clearly distinguished from other diseases by peculiarities of their own, so that identification alone affords, or necessarily suggests, their occupational character. On the contrary, we are dealing in large measure—probably when the full truth is known it will be found to be in largest measure—with ordinary diseases found elsewhere but which may be due to occupation and which can be identified as occupational only by inquiry as to the circumstances of the patient's calling. In a word, many occupational diseases are distinguished from others primarily by their causes, so that only by their causes can they be identified.

To put this matter in the concrete, there is one industrial disease, compressed-air illness or caisson disease, which is practically always

due to circumstances of occupation. And there are a few poisonings, the most notable example of which is—or rather we may now say, fortunately, has been—phosphorus necrosis, which are known to be due so frequently to occupation that they have acquired the name of *industrial* poisonings. There are also one or two infectious diseases, the leading example of which is anthrax, which likewise are so commonly associated with an occupation that they immediately suggest occupational causes. Even in these fairly well-recognized industrial diseases, however, the physician must go back of diagnosis to identify them as occupational in character, as witness instances lately reported in New York State of lead poisoning in the case of a schoolboy, of phosphorus and mercury poisonings in cases of children, and of anthrax in the case of a stock broker.

A more striking illustration of this point is another New York case in which only the accidental discovery of occupational causes prevented an absolutely incorrect diagnosis of a case of industrial poisoning. In a brewery in the state two men were employed last year in varnishing the inside of closed wooden vats with alcohol and shellac. After a day of such work one of them became violently ill and died during the night without medical attendance. The coroner's physician, on examination, found the cause of death obscure, but, on the strength of what he could discover by inquiry concerning the patient's illness, certified the cause of death as apoplexy. On the day of the funeral the physician heard that the other workman had become blind, and for the first time learned what kind of work the two men had been doing. Thereupon he procured a sample of the alcohol and shellac, had it analyzed, and found that the alcohol was wood-alcohol, with the result that both the nature of the disease and its occupational cause were revealed, and his certificate as medical examiner was accordingly altered to make the cause of death wood-alcohol poisoning. This is, of course, an extreme case, but experience in connection with the registration of deaths affords evidence that such errors are frequent enough to sustain the point here emphasized, namely, that even in the case of the more exclusively occupational diseases the physician must probe for causes back of his diagnosis if registration is to realize what is needed.

This extra-professional information which the physician must

be asked for, in order that the identity of the disease as occupational in character may be evident, at least presumably, comprises two items. First, and rather obviously, but none the less of most importance, is a careful statement of the patient's occupation and the industry in which it is pursued. Upon this, of course, all accurate statistical study of the whole subject depends. It is, likewise, the first necessary inquiry of the physician in determining the occupational character of the disease. Had the physician, in the case of wood-alcohol poisoning above referred to, looked at once for this item, which he accidentally noticed later, doubtless his first certificate of the cause of death would not have gone so wide of the mark.

But, as already noted, comparatively few industrial diseases are caused exclusively by occupation. Many may, or may not, be occupational in character. Furthermore, even in the case of an exclusively occupational disease, other factors may also be present. Hence, in the second place, if we are to read correctly the responsibility of circumstances of occupation for disease, the physician must be asked to look for the other possible causes, and to report any factors other than occupation, such as complicating diseases or personal circumstances, which may be contributing or accompanying causes.

Now it is precisely in connection with this extra-professional information that the principal difficulties arise with physicians' reports,—that is, of course, after the primary task of bringing and keeping before physicians the necessity of reporting at all is accomplished. The reasons for this are natural enough, since all the necessary information as to occupational or other causes lies beyond the strictly professional interest and point of view of the average physician, and he must secure it by special inquiry outside of his purely technical duties. For example, when the New York law requires that all cases of occupational lead poisoning shall be reported, it means that every physician who may treat a case of the disease, after his professional work of diagnosis and prescription is attended to, must first of all remember that lead poisoning is to be reported, and that then he must make inquiry as to the patient's occupation, must ascertain whether any other factors enter into the case as causes, and must record this information with the necessary details, along with a number of other items as to sex, age, etc., all outside of his natural professional interest except as general obligation toward the public welfare may appeal to him.

To a large extent the difficulties referred to are those long familiar in connection with the registration of deaths by physicians, and simply argue that without doubt a long period of education will be necessary to secure general and accurate observance of a reporting law for industrial diseases. Indeed, so far as the report of diagnosis and the statement of occupation alone are concerned, the problem is precisely the same in both forms of registration. But when we come to that element in the reporting of diseases which virtually requires the physician specially to weigh the causative influence of occupation, as compared with other possible causes, there is a fundamental difference between the two. Registration of deaths requires a statement of occupation only as a simple addendum to diagnosis, and requires no consideration whatever of occupation as the cause of death. But such consideration is essential, as pointed out above, in the registration of industrial diseases. It is specifically implied, moreover, by the very terms of the New York reporting law which, like all but one of those in other states having such a law, follows the British act, and which requires a report from the physician for each patient "whom he believes to be suffering from (the specified diseases) contracted as the result of the nature of the patient's employment."

The most significant aspect of this peculiar source of difficulty connected with the reporting of industrial diseases is that it increases in importance as compulsory reporting may be extended from diseases known to be exclusively or mainly occupational to those whose sources may be either in occupation or in other circumstances, or in both combined. For, as we proceed in this direction, the causes of the disease become more and more uncertain and complex, with consequently increased difficulty for the physician who is called upon to determine, or at least to express his belief as to, the influence of occupation. Compare, for example, caisson disease and tuberculosis as to the relative difficulty of determining whether occupation or other factors were responsible for the disease.

This aspect of the reporting problem naturally suggests the question of how general the reporting should be made. As a matter of fact, reporting laws enacted in this country so far, here again in accordance with the British act, have limited compulsory reporting to a small number of easily identifiable industrial dis-

eases, namely, as in the New York law, poisoning by lead, phosphorus, arsenic or mercury or their compounds, anthrax, and compressed-air illness. All of the American laws are of very recent date and the wisdom, at the outset, of such limitation of reporting would seem to be clear from what has here been said. Nevertheless, if the problem of industrial diseases is to be treated broadly, and if the prevention campaign is to be planned on comprehensive lines, nothing less than an extension of registration to all recognizable industrial diseases must be considered as the ultimate goal.

This may appear, at first sight, to be only an ideal whose consideration may well be postponed for the present. But a rather interesting experience in New York State has brought it forward for immediate consideration. The New York reporting law took effect in September of last year. Prior to that time notices of the law were sent to medical journals, and shortly thereafter a circular notice and sample forms for reports were mailed to each of the 13,700 physicians, hospitals, and dispensaries in the state. The form adopted for reports was patterned after that used in Great Britain, was kept as simple as possible, and was limited to the few items specifically mentioned in the law, without taking advantage of a blanket clause permitting the inclusion of other items of information. The form was made thus simple with the express idea of encouraging reporting by making it as easy for the physician as possible. (It may be remarked, parenthetically, that the nine months' experience so far makes it very evident that something besides making it easy will be required to make reporting general, even with a very limited list of diseases). But the law had not been in force three months before we were met by the suggestion, from members of the medical profession itself, that we were not calling for enough information in our report form and that reporting ought not to be confined to the diseases mentioned in the act, some of which were not so common or serious as others not included. This was, indeed, far from being a general clamor from the profession as a whole, but it was an earnest expression of opinion from a few prominent members in New York City, who are interested in the subject.

The question of the extension of reporting to all industrial diseases thus raised, it must be confessed, in an unexpected quarter, but in the very one to make it the more to be regarded, became then an

immediately practical one in New York. To come at once to the result of the matter, the New York Department of Labor proposes to ask the cooperation of physicians to the extent of reporting all industrial diseases, and is just completing the work of inaugurating such extension. The reporting law has not been amended for this purpose, but it is proposed, for the field outside of that specified in the law, to rely for the present, at least, upon the voluntary cooperation of physicians.

While New York, relying upon a cue from members of the medical profession itself, thus proposes to start at once definitely toward the ultimate goal, it will be evident from what has been said in this paper that the difficulties of this larger program cannot be overlooked, and a word or two as to practical means of meeting these difficulties is in order.

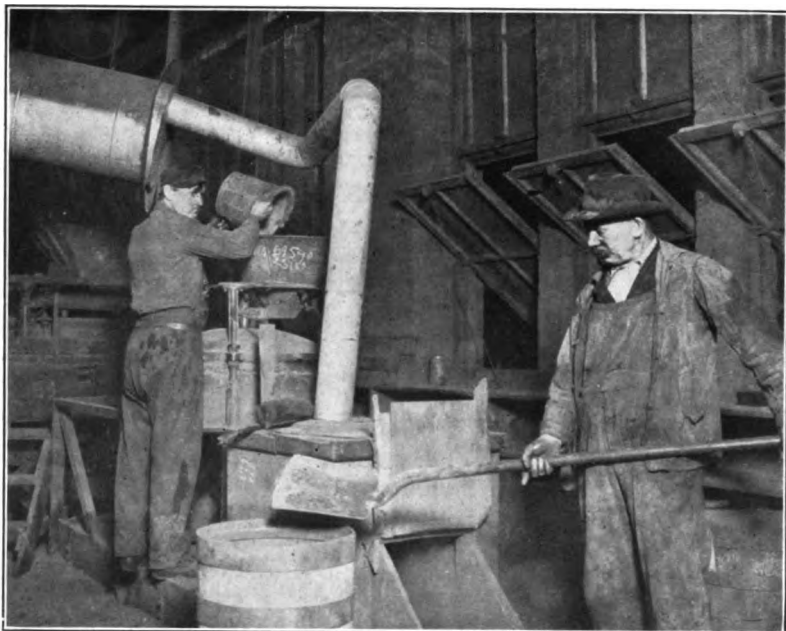
Government offices to which reports are to be made have two chief means of overcoming the difficulties referred to. The first of these is a carefully prepared form for reports, which shall clearly indicate the information needed. For this there may be commended one worked out by the committee on industrial diseases of the New York Association for Labor Legislation, and recently adopted with some modification by the New York Department of Labor in connection with the extension of reporting above alluded to. This form is indorsed by the committee on uniform schedules of the national Association for Labor Legislation, which recommends it as a standard schedule for use in all states. But, as repeatedly suggested in the foregoing analysis of the reporting problem, ultimate success must finally rest to a large extent upon the active interest of physicians. A second aid to reporting, therefore, may be found in the circulation among physicians, for their assistance and to stimulate their interest, of information concerning industrial diseases. For an example of this, reference may be made to a booklet recently issued by the New York department, containing brief descriptive matter and a general classification of industrial-disease hazards, with a list of the more important harmful substances and their effect upon workers. Reference to this may be made by the writer with all modesty because, for the material, the department is largely indebted to representatives of the New York Academy of Medicine, especially to Dr. W. Gilman Thompson of the Cornell University Medical College.

In the foregoing, compulsory reporting of industrial diseases by physicians has been considered only in its general aspects and chiefly from the statistical point of view. From that point of view the problem of accuracy and completeness of reporting are matters of foremost importance. It has been made clear, perhaps, that the solution of these problems will be a matter of considerable time and education, a conclusion which is supported, not only by analysis of the problems, but by consideration of the number and character of the reports produced by nine months' experience in New York. But, lest a wrong impression as to the value of reporting should be given by this technical view of the matter, two practical results, already clear in New York experience, may be mentioned in conclusion.

In the first place may be noted the very active interest among a number of influential members of the medical profession which the reporting law almost immediately aroused, or at least crystallized into activity. This has already been alluded to in connection with the assistance it has lent the department of labor with reference to reporting. The most significant fruit of it, however, has been the formation of a permanent committee on industrial diseases under the auspices of the New York branch of the Association for Labor Legislation, six members of which committee are physicians connected with medical colleges and leading hospitals in New York City. The value of such active cooperation of the medical profession in the campaign for industrial hygiene, going far beyond mere reporting of diseases, can hardly, of course, be overestimated. If the reporting laws of the seven other states in which such laws have been enacted, have revealed possibilities of this kind such as have appeared in New York within the first few months under its law, the work of the American Association for Labor Legislation, in securing the enactment of these laws during 1911 and 1912, must be regarded as marking the beginning of a very important forward movement.

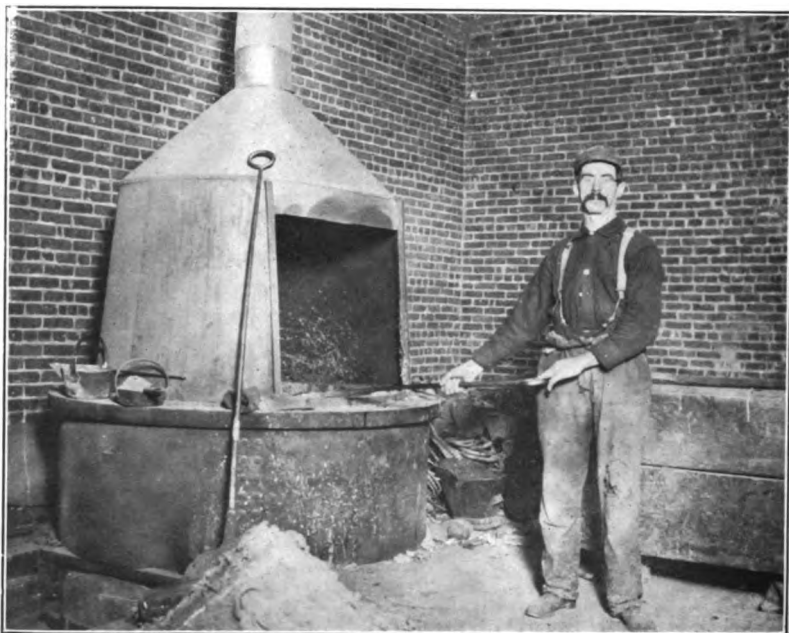
In the second place is to be noted the practical value of reports of industrial diseases as indices of points of danger, for the guidance of factory or medical inspectors. This is a value which may be realized practically from the very moment that reports begin to come in, without regard to the statistical problems of reporting. Each individual report at once invites attention to an establish-

ment or an industry for investigation with a view to preventive measures, and as reports multiply the field demanding attention becomes more and more clearly indicated for the inspector. To illustrate, the medical inspector of factories in New York State is just beginning a special investigation of lead poisoning. As a result of only six months' returns under the reporting law, the medical inspector may begin his work with definite knowledge at the very outset of fourteen different manufacturing industries and of one or more particular establishments in each of those industries, in which conditions positively known to have caused lead poisoning are offered for immediate application, or study, of preventive measures. Here again, therefore, the enactment of reporting laws in eight states must be regarded as marking a very important step forward in the practical preventive work of the factory and medical inspector, and prevention is, of course, the ultimate goal in the whole matter.



MAKING LEAD COLORS

POURING PIGMENTS INTO GRINDING MACHINE AND SPRINKLING COLOR SOLUTION WITH LEAD LITHARGE



LEAD CASTING, SHOWING LEAD POT IN A SMELTER

DANGER OF POISONING IS FROM BREATHING LEAD OXIDE, FUMES AND DUST.
THE WORKER IN THIS PICTURE NOW LOSES ON AN AVERAGE ONE
DAY A WEEK ON ACCOUNT OF CHRONIC LEAD POISONING

LEAD POISONING IN NEW YORK CITY¹

EDWARD EWING PRATT

New York State Factory Investigating Commission.

It has often been said that, compared with foreign countries, there has been and is very little lead poisoning in the United States. Recent investigations, however, throw considerable doubt upon these conclusions. The Illinois commission, during the years 1908, 1909, and 1910, found five hundred and seventy-eight cases of lead poisoning in that state alone. Last fall a hasty study of lead poisoning in New York City revealed three hundred and seventy-six cases which had occurred during the years 1909, 1910, and 1911. And during the year 1911 alone there were found one hundred and twenty-one cases. This study was based largely upon hospital records, and therefore includes only the more serious cases; a vast number of less serious ones must have been treated in dispensaries and by private physicians. These facts are startling when we think that in England during 1910 there were only five hundred and five cases. In a single year New York City had one hundred and twenty-one cases,—all England five hundred and five.

These cases of lead poisoning were not confined to any one trade or industry, but were scattered through a considerable number. The industries represented, in which the victims had been employed, were the following; white-lead, lead-acetate, lead-oxid, dry colors, use of lead as a hardening agent, scaling paint on battleships, ship-calking, diamond-polishing, printing, carpentering, plumbing, tin-smithing, and painting.

A canvass of the hospitals in New York City was made, and all the cases of lead poisoning or plumbism which they had treated during the last three years were selected. Names and addresses of the persons and any other available facts were taken from the hospital records. These records were lamentably lacking in everything that

¹ The facts given herewith are taken from a study made last fall and winter, by the writer, with the cooperation of a number of his students, and submitted to the N. Y. State Factory Investigating Commission.

would interest anyone who wished to make a study of lead poisoning and its causes. In only two hospitals in Greater New York were occupations specified more accurately than "laborer", or "painter", and in these two exceptional instances the information was not more detailed than the statement, "lead worker", "molder", "carriage painter", etc. No hospital recorded where the victims had worked, or under what conditions. However, with these names and addresses, and a few which were furnished by the New York State Department of Labor, the labor unions, the board of health, and several employers, the men themselves who had been leaded were visited.

It was not always easy to find the people we wanted, for, in addition to the difficulties due to false addresses, which are habitually given at hospitals, we found it difficult to locate Poles, Slavs, Russians, Lithuanians, Italians, and others of our recent immigrants. I remember searching for a man named John Sichosk, whose name had been sent in by the department of labor. At the address given, only the blankest faces answered my inquiry for John Sichosk. In broken English one of the men explained that he knew no one by that name. As a last resort I showed the record card with the typewritten name. The man's face lighted up at once, "Oh! John Sichosky! Sure, he live upstairs." He was there all right, and before the afternoon was over John had taken me to five others who had been leaded in the same factory.

A careful study was made of each case. The facts, not only about the man's last job, but concerning others as far back as he could remember, were ascertained. As far as possible the maternal history of the wife was obtained, the personal habits of the worker, and the precautions or lack of precautions in the factory. One hundred and nine cases, in all, were intensively studied in this way. The results are interesting, even if the small number of cases somewhat detracts from their value. In general, these results are similar to the results of studies made abroad.

Practically all the various forms of lead poisoning were found, ranging from light attacks of colic to death. Among these cases were several of wrist-drop and paralysis. Many of the workers had had recurring attacks and had been disabled for considerable periods, varying from a few days to almost a year. About half of the men were comparatively young; in fact, fifty of the one hundred and nine were actually less than thirty-five years of age, and

almost one hundred were less than fifty-five years of age when they became leaded.

Economists of the old school have always held that men's wages increase with the dangers and risks of their employment. This is certainly not true of lead workers. Over half of the workers studied (fifty-eight) were earning less than \$16.00 per week; a quarter (twenty-three) were earning less than \$12.00; and over a tenth (thirteen) were actually earning less than \$10.00. Strangely enough, the most dangerous of all the industries paid the lowest wages. In the white-lead industry not a single man was earning over \$14.00 per week, and many of them were earning less than \$10.00. At these low rates one would imagine that the total loss of wages due to lead poisoning would be comparatively small. It is not surprising, therefore, that most of the losses were of small amounts, and that fifty-nine of the one hundred and nine men lost less than \$150 each. But it is a surprising fact that some of these workers lost larger sums, seven men actually losing over \$1,000 each.

Some very interesting facts were brought out in the analysis of conditions in the factories and workshops. Sixty-two of the one hundred and nine workers ate in the same room where they worked; twenty-two never washed before eating and forty-five washed only in cold water; seventy-three, or almost three-fourths, were never given oral instructions of any kind as to the dangers of their work or as to methods of preventing lead poisoning; seventy-six men never saw any posted instructions where they worked. It is usually admitted that men addicted to alcohol are more liable to contract lead poisoning, as they are to succumb to most other diseases. Employers delight to say that it is only the "hard drinkers" who are ever troubled by lead. But only six of the one hundred and nine men were found to use alcohol to excess; sixty-five were moderate drinkers; and thirty-one were teetotalers. These facts point out and emphasize the importance of the problem, right here and now in this country, and the need of prevention, the first steps in which have evidently not been taken by the majority of employers.

Of the one hundred and nine cases studied, seventy-nine persons were married, among them forty men whose wives had been pregnant while their husbands were employed at lead work. In all there had been one hundred and fifty-seven conceptions among these forty

wives. There were born to the persons one hundred and forty-four children, thirty-nine of whom died in the first year, and two in the second. The cause of death in many cases was malnutrition and convulsions. In addition, there were four still-births and eight miscarriages; and the latter figures understate the facts, as our information on this point is not full nor very accurate.

The effect upon reproduction has long been noted. Some interesting cases have come to my attention:

1. A young Hungarian came to this country in 1904. He worked in a wire mill, where the wire is tempered and hardened by being passed through a bath of molten lead. The lead is uncovered, and vapors and oxids fill the air. He married in 1909. In the same year his wife miscarried at the end of seven months. Early in 1910 a second child was born but died of convulsions within two weeks. About this time the husband had a severe attack of lead poisoning and was given another job. In January of this year the wife gave birth at full term to a normal child.

2. A Barbadoes negro came to the United States in 1908. He was married and had a little daughter, at that time two years of age. He found work in a lead factory handling and packing sugar of lead, or lead acetate. The following year his wife miscarried at the end of seven months. A year later a child was born at full term, but died in convulsions when six months old. The curious part of this case is that the worker himself was unaffected until a few months ago and until after the birth last referred to.

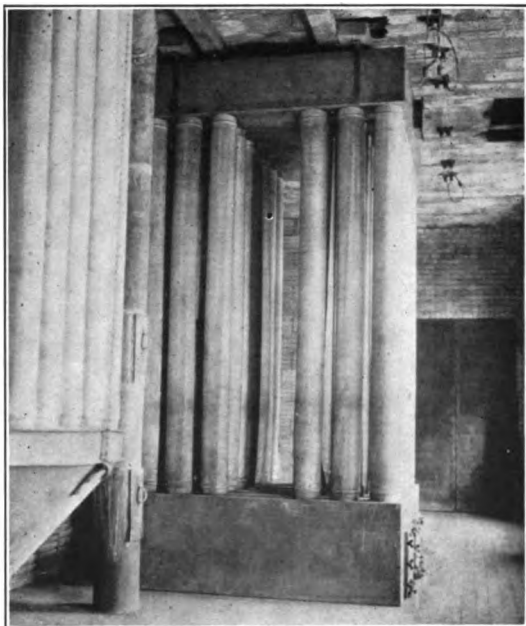
3. James Scott was a printer for over forty years and died of lead poisoning. He was married in 1868. Of twelve births six children survived, four died from various causes during their first year, there was one still-birth and one miscarriage.

4. Alexander Joronsky, a Pole, came to this country in 1891. After having various unskilled jobs, he found employment as a stripper in a big white-lead factory. During his period of employment as a stripper his wife gave birth to four children; one of these was still-born, and the others lived four days, three days, and one day respectively.

5. A Hungarian painter, who came to this country in 1893, presents an interesting case. Five of his ten children died within a year of their birth and his wife has had two miscarriages. The man himself, however, had his first attack very recently.

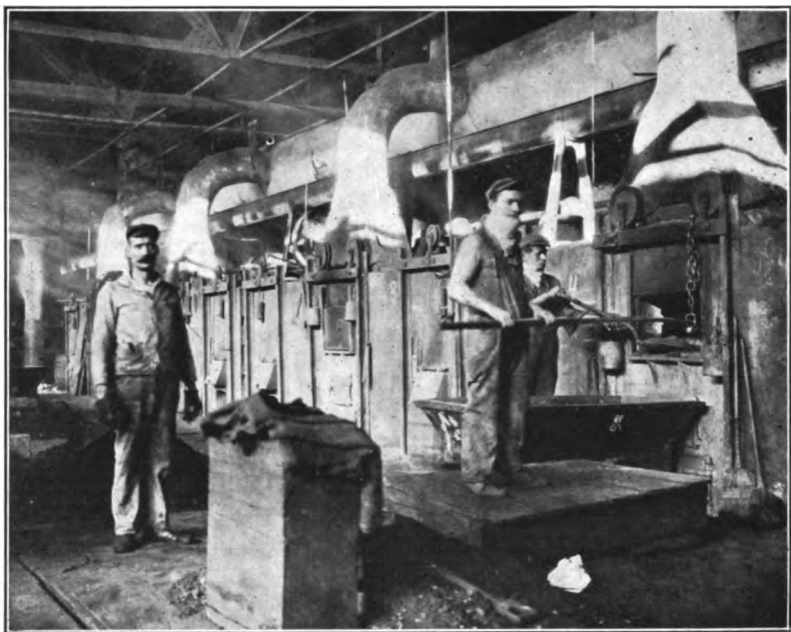
The investigation of hospital cases at once opened up numerous others, and also gave us clues to factories where there were lead processes of which we did not know. The next step in the investigation, therefore, was the inspection of factories.

One of the first cases which came to our attention was a pathetic case of double wrist-drop. The victim, a man of middle age, had worked in a magneto factory. It was a big place, with many hun-



DUST COLLECTORS IN A LEAD PLANT

CLOTH BAGS PERMIT AIR FROM EXHAUSTS TO PASS THROUGH WHILE RETAINING LEAD DUST WHICH FALLS INTO BINS AND IS SAVED. IN UP-TO-DATE PLANTS THE BAGS ARE SHAKEN BY A MECHANICAL DEVICE OPERATED FROM OUTSIDE OF DUST HOUSE



EMPTYING A RED-LEAD FURNACE

WHEN OXIDIZED IN FURNACES THE LEAD IS RAKED OUT INTO CARS. IN SPITE OF POWERFUL EXHAUSTS AND HOODS SOME DUST FLOATS IN THE AIR AND IS BREATHED BY THE WORKERS

dreds of employees, but the lead process was carried on exclusively in one small room, a sort of lean-to at the rear of the factory and a little below the level of the ground. Here were located five lead pots, the temperature of which varied from 800 to 1500 degrees. These pots, when inspected, were covered by hoods leading to a chimney, but were not provided with any blower attachment. The roof was raised slightly and a fan at one end gave a fairly good air circulation. In the process preceding the so-called "hardening", bars of steel are bent into the horseshoe shape of a magnet. They are then brought into the hardening room and immersed in a bath of molten lead. There they remain for a specified length of time, when they are removed and suddenly immersed in water. After cooling they are stacked up, one above the other, and are rubbed down with sandpaper to remove any particles of lead that remain. This process, at the time when the inspection was made, had been in operation for less than a year and nine men were employed at it. I found seven cases of lead poisoning; one had resulted in death, and one in double wrist-drop; others had necessitated long periods of unemployment.

A wire mill carried on a similar process. Here the tempering and hardening is done by passing the wire slowly through a bath of molten lead. The wire is wound on huge spools revolving slowly, and is then wound onto another reel. The room is habitually full of smoke, gas, and fumes, and the men work intolerable hours,—two shifts of twelve hours each, with no time for meals. They have to snatch what they eat,—because the lead positively cannot be cooled off.

In both of these processes the danger comes, I believe, not from the fumes of molten lead, but rather from the particles of lead oxid which probably fill the air. In both cases the skimmings from the lead pots are brushed carelessly aside and allowed to fall upon the floor, or to accumulate in piles beside the pots.

Some of you will wonder how a girl working in an embroidery factory can be poisoned by lead. You will doubtless scoff at the possibility of a worker on embroidery contracting lead poisoning. But I have found two such cases. The designs to be embroidered are stenciled on cloth. This is usually done with a mixture of chalk and talcum powder. One resourceful employer, however, observing the way in which the chalk rubbed off, substituted dry

white lead, which clings more tenaciously. The girls who used it were ignorant of its poisonous character and handled it as carelessly as they had handled the chalk. They pounded it into the stencils and the dust rose in their faces and the lead covered their hands. Little wonder they got lead poisoning. The use of lead for this purpose is common.

Another case, which is individually the most pathetic I have seen, is that of William O'Connell. O'Connell has now been out of work for about eleven months and is likely to remain so, as he is totally incapacitated. The interesting and exasperating thing about it is that he is our employee,—speaking collectively,—because O'Connell was in the employ of the United States government, immediately under the Navy Department and a worker in the Brooklyn Navy Yard, where his job was that of “scaling” in the double bottoms. Battleships are provided nowadays with double bottoms, a shell which envelops the entire keel of the ship; between these bottoms is a space of about two and one-half feet, which is divided into compartments of from four to six feet square. In order to prevent rust these double bottoms are painted with red oxid of lead, sometimes to a thickness of one-fourth of an inch. The process of scaling consists of scraping off the red oxid paint with an automatic compressed-air chisel called a “hammer”. When in operation this hammer throws a spurt of dust up into the faces of the workmen, who wear goggles but no respirators. Sometimes several men work in one small compartment, and they tell me that it is almost impossible to see the electric bulbs at their elbows. “And then when the air hose breaks, you ought to see the place!” one of the men remarked. Think of working in such a place for eight hours a day! It is any wonder that, out of a squad which averaged about fifty men, we found twenty cases of severe lead poisoning, including two deaths and O'Connell, who is totally incapacitated? And these men have no washing facilities, they wear no respirators, there is no exhaust, there are no accessible eating facilities, there is no medical inspection, and they get no compensation. The government gives no compensation for lead poisoning because, technically, it is not an accident,—which is true, for under the circumstances it is a dead certainty. Yet the surgeon of the post asked me,—a layman,—“Why! is that work dangerous?”

Other industries contributed their quotas of lead poisoning cases.

One firm, manufacturing white and red lead, reported through its physicians twenty-four cases from October, 1910, to October, 1911. We dug around a bit and found a dozen more. About two hundred men were exposed. In another white-lead works, where the factory had been running with about two dozen men, we found eight cases diagnosed by the factory physician. In another white-lead factory the superintendent claimed that no case of lead poisoning had ever occurred during his ten or a dozen years there; for, said he, "We send a man off when he shows the first signs of being leaded." The next Sunday I saw five men who had been leaded in that plant, and who had been out of work for periods varying from a week to almost a year. One poor fellow had had four separate attacks and had gone doggedly back to the same job. Just the week before, when he was suffering severely from colic, this same superintendent had on two occasions sent a messenger to him asking him to come back to work.

Of all the industries which I have studied, painting, especially interior decorating, yields more lead poisoning than any other, not proportionately but in the total number of victims. Man after man had the same tale to tell,—a long job, close interior work, sandpapering, stipple, painting, more sandpapering and more painting, a sudden overpowering attack, and a period of sickness and idleness, leaving him just at the end of the busy season when it is impossible to find work.

It does not occur to many of us that in New York, at any rate, a building in course of construction is absolutely (with one or two possible exceptions) without the pale of the law. And yet any new building in course of construction in New York City has constantly working in it from two hundred to six hundred, or even more, men. These men are usually working under almost intolerable conditions, with a complete lack of sanitary conveniences, no washing facilities, no provision for eating, and no attention to health or hygiene. Many a painter has related to me how impossible it is for him to wash his hands for lunch, and how he is forced to hold his sandwich between two pieces of paper in order to keep his lead-covered hands from coming in contact with his food. It is not a difficult matter for a builder to safeguard his painters. He can use zinc white, which is better in some ways than white lead and is but slightly more expensive. In fact, one of the biggest so-called speculative builders in New York City now specifies white zinc and wet sandpapering.

We have now acquired in this country, I believe, a body of evidence which demonstrates the prevalence of lead poisoning and other industrial diseases. They may not be as prevalent as abroad, but I doubt it. The industries in which these diseases are found employ unskilled, non-English speaking workers, who pass quickly from one industry to another, and who seldom come under the observation of the authorities.

In preventing industrial disease, especially lead poisoning, an educational campaign is, it seems to me, the thing of prime importance,—education of the worker and education of the employer. The first step in the education of the employee is a knowledge of the rudiments of English, then the simple rules for the care of health and self which are so effective in preventing lead poisoning. The employer, on the other hand, should be told that there is such a thing as lead poisoning, and then how to prevent it and how to treat it. There are many employers who are willing and anxious to safeguard their workers. One white-lead manufacturer is spending \$20,000 on prevention. He may not be doing it in the right way, but he has got the right spirit and will doubtless do more,—more in fact than he could be forced to do. Then, let us bring on the legislation and force the recalcitrant employers into line.

GENERAL DISCUSSION

I. LEAD POISONING

MR. F. V. HAMMAR, *President of Hammar Brothers White-Lead Co., East St. Louis, Illinois*: I think the pictures shown by Mr. Pratt demonstrate one fact, and that is that all lead poisoning comes from lead dust. Factories can be made sanitary by the elimination of dust. This statement relates, not to industrial poisoning as a whole, but to white lead, and is based on experience in my own factory. We are not appalled by the lead menace. Our record of twelve years is not one death, either in our lead smelter or in our white-lead works, and in the past eleven months we have had but four reportable cases under the Illinois law, and the loss of labor was not to exceed fifteen to twenty days. The experience of those who have been reasonably successful in controlling lead poisoning, with a view to minimizing the laborer's loss of wages and preventing any danger to his future health, should be of interest.

No consideration of the sanitation of lead works is valuable until the avenue of entrance of various poisons, dusts, fumes, or gases into the human body is satisfactorily settled. If you do not know how toxins get into the body, you have little hope of knowing how to keep them out. Lead poisoning seems to be particularly productive of theories as to causes of inoculation. But, as a practical fact, lead is non-poisonous until brought into contact with the fluids of the alimentary tract, chiefly hydrochloric acid in the stomach. Undissolved lead is no menace, and only when dissolved by the organic fluids is it absorbed into the vascular system. Such solvents are lacking in all organs except the alimentary tract. Therefore the skin, abrasions of the skin, the scalp, under the finger nails, and even the lungs, are not avenues of entrance of toxins. If they were, they have little if any power of converting sufficient lead salt into soluble poisons and absorbable solutions to be a serious menace to health. There is no doubt but that mild plumbism may result from lead hair dyes and lead face powders, and that lethal quantities may be forced into the pulmonary organs of a cat, but the menace of

such special conditions is so rare and so slight that, for general purposes of sanitation, we may assume that the only avenues of entrance are the nose and the mouth, and that the only place of conversion into absorbable liquids is the alimentary canal.

The cardinal principle of lead-works hygiene, therefore, is to prevent the lead salt, in any form, from entering the nose or mouth. The first necessity is to inform all workmen of the danger of lead poisoning,—that it comes from working in lead dusts; that the first symptoms of intoxication are constipation and colic; and, of great importance, that as soon as they notice alimentary disturbances, they are to report at once to the foreman and to the factory physician for treatment.

That men may work in a minimum of dust, forced drafts, hoods, and artificial ventilation are necessary. It is generally recommended by authorities that floors should be of such material that they may be flushed daily, and this is most desirable. If all lead works could be rebuilt, for this and other economical reasons, they would have concrete floors. But we believe forced drafts are more efficacious than flushed floors because, while it is most desirable that floors should be clean, the first truck or barrel that passes over them drops some lead salts, and the quantity on the previously clean floor accumulates in proportion to the work done during the day. Lead salt is, as a rule, of high specific gravity and only a small proportion of the siftings are carried into the air. As a result, while the floors may not be immaculate, the ventilators soon remove floating particles, and leave the air cleaner and more sanitary than where the floors are flushed daily without the forced draft and ventilation.

There is no doubt in our minds that under all circumstances and conditions, no matter how perfect the ventilation and cleanliness, wherever lead dust is in the air the workman must wear a protection over the nose and mouth. We have to some satisfactory extent perfected a "mask" that is inexpensive, affords a maximum area for air filtration, and, once it becomes damp from the laborer's breath, is an excellent protection against dust. The workmen wear these masks without objection, and the results are very encouraging. There are places in all American factories where fans, drafts, or flushed floors are impossible. In these departments the workmen are forced to wear masks, the circulation of air is as free as possible, the hours of labor are reduced to a minimum, and the physician

gives his especial attention to the men employed. Our records show that, by these means, the menace is reduced to a minimum. We find it essential to separate the dusty departments from those where no dust originates, for the men who handle lead in oil never suffer from plumbism, and in the latter department the liberal use of ordinary floor oil is quite satisfactory. It fixes in place such dust as may blow in and assists in sanitation.

All of these suggestions are only coordinate with shower-baths, washing facilities, places for eating outside the factory, frequent sweeping, and above all constant vigilance to see that the laborer realizes the danger and uses the precautions furnished. But all these items are precautionary. The active and effective agency in the conservation of our workmen's health is an excellent physician. No system of prevention can be devised that will be so perfect as entirely to prevent plumbism among men of the small intelligence of the average day-laborer. The tendency is always to minimize the danger and to disregard positive orders regarding wearing the mask and proper cleanliness in eating. Therefore men do get lead colic, and they often neglect to report it until it becomes severe. In fact, such serious cases as we have had have almost invariably arisen among strong, vigorous young white men who, in the egotistical belief that nothing can hurt them, neglect, as far as they dare, our regulations for their protection, especially in emergencies. That we may treat cases in their incipency, our physician personally sees all the workmen every Friday. The men whom he suspects of intoxication are held for personal examination. His experience enables him to spot a suspect at sight and a few words completes the diagnosis. There is a great advantage in reaching the case in its incipency, when a spoonful of Epsom Salts will effect a cure.

There is no doubt that white lead is a menace. But there is also no doubt that this menace can be controlled. For such control regulation and law are necessary. We believe in legislation for dangerous trades. The necessity for it comes, however, from ignorance rather than from essential danger. We believe that every man working in lead should realize how and why he may become intoxicated and, equally important, how he can avoid serious results. Legislation is necessary that this information shall be disseminated; and legislation helps the manufacturer by assisting him to enforce regu-

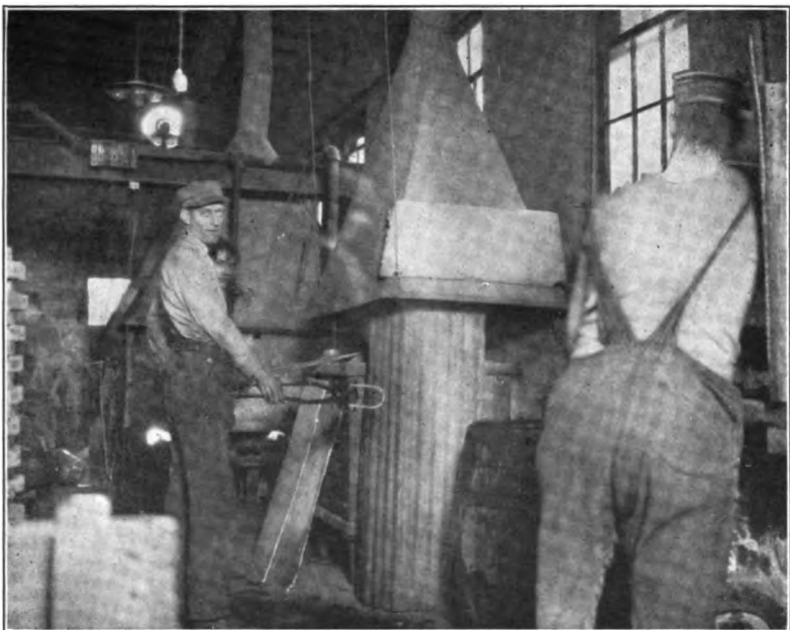
lations. That plumbism can be controlled to a satisfactory degree I know beyond a question of doubt, and if your Association can suggest any practical methods or regulations that will assist in removing the menace to labor, all white-lead makers will give you hearty cooperation.

DR. JAMES P. WARBASSE, *New York City*: I have listened with interest to this apology for the lead industries. But I think there is one point to bring out, that the lead industry is practised for the profit there is in it. There are satisfactory measures for protecting the lead worker, but I do not agree with the previous speaker that adequate means of protection are now used in any factory in the United States. The question of profit is the important side and it behooves us, as students of industrial diseases, to bear this fact in mind.

DR. J. W. FOSS, *Arizona*: The statement has been made that the only way a person can become poisoned from lead is through the intestines, and not through the skin. Only last evening Dr. Anderson of the Navy told me they had been making investigations of the poisoning of the men who chip off paint scales in the Brooklyn Navy Yard. They made tests and it was thoroughly demonstrated that in seven days you could get poisoning by rubbing lead on the skin. The investigations made by the Navy show that it is a great error to believe that you cannot be poisoned except through the intestinal tract, and that we ought not to allow this idea to go out.

MR. HAMMAR: The men who work in the Navy wear goggles instead of respirators. I contend, very reasonably, that if they keep the dust out of their mouths they will keep it out of their systems. But I was speaking of white-lead works, and ninety per cent of lead poisoning comes from sandpapering and not from lead works.

DR. C. T. GRAHAM-ROGERS, *Medical Inspector of Factories, New York*: The fact that lead is absorbed through the skin and produces toxic effects is brought out by Rambousek of Austria and Roth of Germany, in works published within a year. The method of poisoning indicated by Mr. Hammar is the more usual, but most of the cases of lead poisoning occur among painters who are work-



LEAD USED AS A HARDENING AGENT

STEEL MAGNETS ARE DIPPED INTO MOLTEN LEAD UNTIL RED HOT, THEN PLUNGED INTO WATER, AND WHEN COOLED, POLISHED WITH SAND PAPER. WORKERS ENDANGERED BY FUMES AND DUST



HEADING UP BARRELS OF DRY RED LEAD

DEATHS DUE TO LEAD POISONING FROM BREATHING DUST IN THIS WORK HAVE SOMETIMES BEEN REPORTED BY PHYSICIANS WITH THE OCCUPATION GIVEN MERELY AS "COOPER". A MORE SPECIFIC STATEMENT OF OCCUPATION IS NEEDED TO REVEAL TRUE CAUSE OF DEATH

ing with lead paints. When they are employed in sandpapering paint and the application of oil is neglected, the poison is absorbed through the skin.

MR. JOHN VOGT, *New York Department of Labor*: I had the good fortune to accompany Mr. Pratt during his investigation, and from the many tests I made of the various oxids came to the conclusion that, where the dust was eliminated as much as practicable, the number of cases of lead poisoning was reduced.

PROFESSOR C.-E. A. WINSLOW, *New York City*: The great possibility of lead poisoning is getting lead into the mouth. It is an ordinary problem of sanitation.

DR. HAROLD K. GIBSON, *Illinois Factory Inspection Department*: Mr. Hammar's remarks are interesting. I believe he is, like others, making an effort to eliminate lead poisoning from his plant. It can be eliminated, but all the dust collectors and improved methods of sanitation and exhaust devices and washing facilities will not do it by themselves. After all, I think the decisive factors are strict personal supervision by foremen and the education of the men in personal hygiene. We have what we call two classes of manufacturers, those who comply with the letter of the law and those who comply with the letter and with the spirit. Mr. Hammar I know to be one of the latter class. All these measures, including sanitation, will not avail unless the manufacturer complies with the spirit of the law.

DR. JOHN B. ANDREWS, *Secretary, American Association for Labor Legislation, New York City*: A year and a half ago Mr. Hammar treated this subject at our annual meeting in St. Louis. I have often cited his work as an illustration of what can be done. There is need of labor legislation to bring other manufacturers up to his standard.

Mr. Hammar is also correct in his contention that the amount of industrial lead poisoning due to absorption through the skin is comparatively insignificant. Practically all industrial lead poisoning, leading authorities agree, is caused by the inhalation or the swallowing of lead vapor or dust.

MRS. FLORENCE KELLEY, *National Consumers' League, New York City*: What is the use of teaching a man to shovel lead and then telling him it is harmful, yet paying him to keep it up. Is there any apparatus on the market to prevent that phase of the business?

MR. THOMPSON, *Chemist, National Lead Company, New York*: I came here on account of our interest in this work. I want to say a word or two in supplement to what Mr. Hammar has said about dust. In our experience the dust is the dangerous element. In regard to mechanical handling, not much has been done on that question, but we are making progress. There is a phase in the manufacture of white lead not yet touched on, however, which illustrates one direction in which a saving of dust can be accomplished. From the time when you put the white lead in the factory, it may be handled in enclosed machinery and no dry lead dust produced until it is put in pans; and even that can be avoided by mixing it with oil. However, the trade requirements are such that this cannot always be done. Some painters will not accept such paint.

We need an educational movement, to be followed by such legislation as is necessary, and I am almost inclined to think, by the time the legislation is accomplished, the manufacturers will have done everything that will be required of them. We sympathize heartily with this work and want to help it along in every way possible. We are spending a great deal of money, from an economic standpoint, in washrooms and in new machinery. The policy of our company, and I speak authoritatively, is not to hold back the expenditure of money in any way which will assist in the prevention of lead poisoning.

II. INVESTIGATION AND REPORTING OF INDUSTRIAL DISEASES

DR. GEORGE M. KOBER, *Georgetown University, Washington, D. C.*: The papers presented this morning are particularly valuable. Very naturally we inquire why there is such a paucity in American literature upon this subject. The reason we have so little literature is that we have had few original investigations, and I think it is exceedingly encouraging that the United States Labor Bureau is recently paying more attention to the question of industrial diseases. I consider that one of the most important duties the bureau can perform is to have expert investigations made into the conditions

affecting the workers' health. This example should be followed by our states. More money should be spent on original investigation, so that we may come into possession of facts to form a literature on the subject. Then we need the training of men and women to this work.

I believe the reason the Germans lead in literature of that kind is that they have a large number of medical officers connected with industrial insurance companies, whose business it is to prevent disease and who naturally give special attention to the investigation of factors which affect the welfare of workers. We may benefit the American laborer to a great extent by encouraging the employment of men whose business it is to give their entire attention to the health of the laborer. The ordinary workman often hesitates until he is really compelled to give up work before asking for medical advice. If he were in the hands of a physician whose duty it was to give attention at any hour of the day, he would ask advice at the earliest possible and most opportune moment.

I wish to make a strong plea for the reporting of all industrial diseases in every state in the union. Until we do this many diseases may be due to industrial causes but not be recognized as such. We should also train up medical men to be perfectly conversant with what constitutes industrial disease.

DR. J. W. FOSS, *Arizona*: I have had some experience in the reporting of diseases, and the question of what should be reported and what compensation should be paid. It would seem right to ask the labor organizations to cooperate, as they have recently done in Arizona in regard to the union label. They sent out letters to all the people who use printed matter asking them to use that label. If the physician is receiving his living from these people he will pay attention to their request.

DR. WILLIAM F. SNOW, *California State Board of Health*: The California legislature of 1911 passed a law, recommended by this Association, requiring the reporting of six occupational diseases. The bill was essentially that formulated by this Association but with one minor change, that reports should be made to the state board of health instead of to the bureau of labor statistics. The state board of health then makes a transcript of the report and immediately forwards it to the bureau of labor statistics.

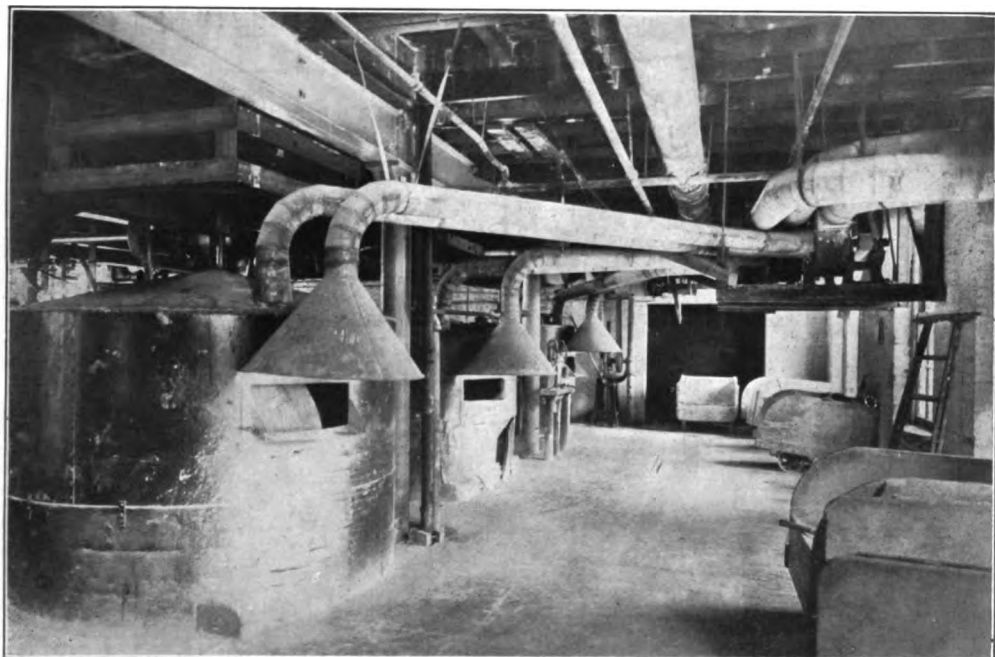
I think it possible that, when a careful survey has been made, we shall find that California does not have, under present industrial and limited manufacturing conditions, a large problem of industrial disease. We are doing some things, however, which may interest you. The labor bureau is in touch with the labor associations of the state and I have given them a list of all the occupations which we thought might be productive of industrial diseases. We have tried to get the names of the secretaries of all the painters' unions and of all the printers' unions. We are also trying, in the principal cities, to obtain information in regard to diseases which are not reported. That is joint work of the health and statistical boards.

The physicians are the biggest factor in reporting. If we could get all the physicians to be active and interested and to study the problem and see the importance of reporting, it would be a great assistance.

PROFESSOR HENRY R. SEAGER, *Chairman*: I am sure we have all listened with the greatest interest to Mr. Hoffman's stimulating and salutary paper. It is just the sort of doctrine we need as social workers to keep us alive and aware of our weakness. But I think most of us would wish to put in a caveat against his description of the manufacturer. He has had in mind the large-scale, high-minded, far-seeing employer. There are many of that type, but I think we must not forget that there are manufacturers of the other type and that the presence of such manufacturers in the community is the justification for public interference, by legislation or otherwise, to remind them that, while tariff protection is to them the all-important thing, to the community at large protection of the lives and health of their employees is even more important.

Mr. Hoffman has called attention to the paucity of literature on the subject of industrial hygiene and the difficulty of obtaining readily the literature that is available. We hope our bibliography of industrial hygiene will serve a useful purpose by giving access to this literature.

One of the achievements of this Association has been the enactment by some eight states of a law requiring the reporting of certain industrial diseases. Dr. Hatch's paper brings out very clearly the fact that in this work we have passed the stage of talking about what we ought to do and are really beginning to do things of value. I wish



**"CHASER ROOM" IN WHITE-LEAD FACTORY
MECHANICAL MIXING OF DRY LEAD AND OIL**

**DRY WHITE LEAD IS SHOVELLED FROM THE TRUCKS INTO THE OPENINGS UNDER
THE EXHAUST PIPES WHICH CARRY AWAY MUCH OF THE
DANGEROUS DUST**

**IN ONE MODERN FACTORY THE CHASERS ARE ENTIRELY ENCLOSED, FILLED BY
MACHINERY LIGHTED BY ELECTRICITY, AND INSPECTED THROUGH
GLASS WINDOWS**

to reenforce what he has said in regard to the cordial cooperation that this Association has had, in connection with its efforts to make the reporting law a success, from leading physicians in New York City. It must be admitted that, at the outset, most of the physicians we communicated with were not enthusiastic about this additional burden. But as soon as it was explained to them, their attitude changed and we have had their cordial cooperation. I hope that the plan worked out in New York State may serve as a model for the other seven states which have laws requiring the reporting of industrial diseases.

III

HEALTH PROBLEMS IN MODERN INDUSTRY

Presiding Officer: WARREN COLEMAN

Bellevue and Allied Hospitals

NEW YORK CITY

THE FUNCTION OF HOSPITALS AND CLINICS IN THE PREVENTION OF INDUSTRIAL DISEASE

RICHARD C. CABOT

Massachusetts General Hospital, Boston.

What are the hospitals doing to prevent industrial disease? Little or nothing. What ought they to be doing? Much. Why? Were hospitals organized to do preventive work and to follow back into the community all the medical problems that the community shoots into the clinics? No; the charters and constitutions of hospitals contain no distinct evidence of any such provision. But public sentiment is beginning to demand that the hospital shall advance, as the country has advanced, beyond the thought of its founders.

Public opinion is beginning to demand that hospitals and doctors alike shall do something to abolish the need of their own existence—shall make, at any rate, a sincere and strenuous effort in that direction. There are those of us who doubt the success of that effort and are inclined to believe that the prevention of industrial disease is largely a moral problem with which the hospital is not organized or temperamentally fitted to deal. But there can be no doubt that the public is putting it up to the hospitals to deal in some way with the many-spreading branches and with the single deep root of industrial disease.

Industrial diseases, such as lead poisoning and “heat cramps”, pass through the hospital and out again like threads in a loom. They represent but one of many such threads of human suffering which, from the hospital point of view, suddenly appear out of the wild jungle of the modern industrial world, are visible for a moment in the cleared and lighted space which science has established in the clinic, and disappear again into the tangled outside world.

It is precisely because there are so many such threads, besides that leading to industry, that no one notices or follows up any one of them. The doctor's mind is distraught with a dim awareness, “out of the corner of his mind's eye”, of this mesh of threads. He sees not only occupational diseases but recreational diseases (poi-

soned recreations) and educational maladies due, like caisson disease, to the crushing pressure of many atmospheres on sensitive minds, or to rarefication of the educational atmosphere, or to poisonous elements introduced in education. He cannot be altogether oblivious of the strands which bad housing, bad cooking, alcohol, morphine, racial misadaptation, and disillusionment weave into the many-colored fabric of misery as it passes through his clinic.

If he had been challenged only by the disgrace of industrial disease, he might have long since picked up the gauntlet and gone into the fight. But he is dimly aware that industrial disease is now in the limelight chiefly because Mr. John B. Andrews and a few other intelligent people have recognized the horror and shame that it is and are focusing public opinion upon it. He knows that poisoned recreation and poisoned education are disease-breeding factors as serious as poisoned air, and that the housing problem, the immigration problem, and the drink problem do as much as industrial risks to keep the public sick and the hospitals busy. But he also knows that he cannot fight all of the giants at once and unaided, and that to recognize them clearly and do nothing about them would render his medical right arm powerless. Hence, with a judicious instinct of self-protective adaptation, he turns his attention elsewhere.

This explains why our hospitals, though called upon to do so much, are actually doing so little to prevent industrial disease. Hospital doctors see no advantage and no heroism in biting off more than they can chew.

But the reorganization of the hospital has begun. Its forces will soon be arranged so that the doctor can call for the help he needs with some confidence that an answer will come. As soon as doctors realize this, they will begin calling for the following:

1. *Trained investigators.*—The human results of industrial disease should be followed up to their source. Was it the patient's ignorance, the employer's negligence, the law's delay, or the predisposing influence of heredity and other conditions outside the field of industry? Whenever one case of industrial disease appears at a hospital there must be many more that didn't. These others must be found.

The investigator should represent the hospital and not an outside agency, because the hospital occupies a position of judicial fairness

and impartiality. It is quite unconcerned with the special viewpoint or class consciousness of the employer or of the employed. It cannot justly incur the suspicion of either, for the hospital doesn't care a button whose fault is represented in industrial sickness.

2. *Educational weapons.*—As a result of the efforts of these investigators, excellent illustrative material will be amassed for the prosecution of campaigns of education among employers, employed, members of legislative bodies, and the general public.

The recent success of the campaign against phosphorus in industry would have been impossible if the agitation had not had some excellent pictures of the effects of phosphorus necrosis on the jaw. The hospitals are very promising fields in which to search for awful examples of this kind, and the examples will be all the more telling and persuasive if they are found by the hospitals' own agents and not by outside agencies exposed to suspicion of prejudice.

Pictures illustrating the effects of diseases and the devices for preventing them should be on the walls and screens of every clinic. They accomplish little by themselves, but if you lead a patient up to one of them and explain the picture and your advice, each by means of the other, you produce a far deeper effect on the patient's mind than you can by talk alone. A clinic thus furnished is a permanent exhibit of industrial hygiene and one likely to produce all the more effect because of its connection with the hospital. Hospitals will probably be slow to set up such exhibits by themselves, but they might be given sets of pictures on trial by an organization interested in industrial hygiene.

3. *Research in industrial hygiene.*—Such research will naturally become a part of any hospital associated with a medical school which maintains an active department of preventive medicine. It will concern the modes by which industrial disease is produced and those by which it may be prevented.

At the beginning of this article I indicated my conviction that it is the hospital's business to look into education, recreation, housing, and alcoholism as causes of disease for the same reason that it is its business to look into industry. Each of the factors just mentioned is as important as industry in causing illness and disability. In closing I wish to say that just because the hospital physician sees the interweaving and interlocking of all these factors as no one else

does, he is pointed out by the finger of common sense as the man most responsible for the difficult task of disentangling them and deciding which is dominant and most deserving of remedial effort. Tuberculosis, for example, is sometimes referred to as an industrial disease and doubtless in occasional cases it is so, but in the vast majority of cases the influence of other factors, such as nutrition, contagion, and housing, is, I believe, more important. The hospital physician, with his eye on all these factors, can take a more impartial and discriminating view of the tangled problem than anyone else. He is therefore the king-pin in the whole situation. Let us try to make him realize the honor and responsibility thus thrust upon him!

TEMPERATURE AND HUMIDITY IN FACTORIES

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Discussion of certain moot points in the theory and practice of ventilation has become so general and sometimes so disputatious that we are in danger of losing sight of the underlying facts upon which experts are in substantial agreement. Yet there is a solid basis of accepted principles and efficient methods; and this basis is amply sufficient for practical application on the part of individual factory owners, even if it is not yet so concretely defined as to be easily embodied in the form of legislative enactments.

In the first place, it is quite clear that the principal thing which makes the air of confined spaces harmful, aside from the special problems presented by dust and fumes, is overheating, especially when combined with excessive moisture. Any temperature over 70° F. puts a strain upon the heat-regulating mechanism of the body, keeps the blood in the skin away from the vital organs, and produces far-reaching impairments of the efficiency of the nervous system, the digestive system, and the body as a whole. Changes in metabolism and blood pressure, to which attention has recently been called by Dr. Gilman Thompson, are similar well-known physiological reactions to temperature change. This general effect of heat and humidity is familiar to everyone who contrasts his own ability to do either brain work or muscular work in the dog-days and in brisk autumn weather. It is established by the exhaustive studies of physiologists in Germany, in England, and in the United States; while the same studies have as yet failed to reveal any definite bad effects due to the chemical constituents of the air. Other atmospheric conditions are still in doubt. The best lower limit of temperature is uncertain. The action of hot, dry air is debatable. The physiological effect of odors in air has not been demonstrated. It is beyond question, however, that the workers in a factory where the temperature is over 70° are injured by a lowering of their vitality that may lead to tuberculosis and other serious diseases; and

that they are working below their normal standard of efficiency, so that both they and their employer are the losers.

The New York State Department of Labor is the only official body in this country, so far as I am aware, which regularly carries out examinations of factory air and publishes the results. From the reports of this department for 1908, 1909, and 1910, it appears that two hundred and fifteen workrooms were examined at seasons when the outdoor temperature was 70° or less. Of these workrooms one hundred and fifty-six, or 73 per cent, had temperatures of 73° or over and sixty-three, or 29 per cent, had temperatures of 80° or more. In a recent study of a mill village carried out by the Rhode Island Anti-Tuberculosis Society, temperature and humidity readings were taken three times a day inside and outside of a weaving room. The outdoor temperature for the month (September) averaged 65.5°. The temperature in the weaving room averaged 75.8°, 10° higher. Is it not clear that, aside from all debatable questions, there is a simple and obvious condition here which directly menaces the health of the workers and impairs the efficiency of industry?

The first clear problem of air conditioning in the factory is the prevention of overheating. The practical method of attaining this end is air change or ventilation. With only a few people in a room, heat may be transferred through cracks and through the substance of walls and ceiling with sufficient rapidity, without any special provision for the purpose. Where many workers are crowded together, however, this is impossible. The average human being at work produces about two hundred and fifty calories of heat per hour, equivalent to the heat liberated by the burning of two candles. In many factories this heating effect is supplemented by the friction of machinery and the combustion of illuminants, and often by furnaces, mangles, steam jackets, pressing irons, solder pots, and other direct sources of heat. The most convenient method of removing this excess heat is by air change; and the primary need in factory ventilation is to provide for the removal of the heated air and its replacement by cooler air from without. The latter must usually be first tempered by raising it to a point a little below that which is normally felt to be comfortable. Whatever may be the case in hospitals and schools, it is fairly certain that incoming air much below 60° would not be

endured by factory operatives; and it would certainly not be compatible with efficiency in the majority of trades which call for manual dexterity.

I am speaking in this connection of the maintenance of ordinary normal atmospheric conditions in the factory. The possibility of occasional variations from this normal is a separate question. It is maintained by many sanitarians that changes in temperature are stimulating and beneficial. There is little exact evidence for this view, but it is in harmony with general experience and is probably correct. In many schools it is the practice to open windows and flush out the room with cold air every two hours or so, and the effect upon the spirit and efficiency of the pupils is said to be excellent. Such a procedure might be well worth the temporary interruption of work in many industrial processes. It is merely a modification of a general system of air conditioning, however, not a separate system by itself. The fundamental problem is the exhaustion of the hot air of the workroom and the supply of cool but tempered air to take its place. I shall not dwell upon the methods by which this end can be attained, since they differ in each individual case. In general, I believe the hot air should be taken out near the top of the room and the cool air admitted near the bottom. The hot air may escape by its own tendency to rise or may be sucked out by fans. The cool air may be admitted at window openings in the room, equipped with tempering coils; or it may be forced from a central point through special ducts. The system of ventilation may or may not be supplemented by a direct system of heating. The essential principle remains unchanged.

When we pass, however, to the question of embodying desirable conditions in statutory form, which is the primary object of your Association, the matter is not so simple. At present there are only two types of laws on the statute books of American states, with the exception of the 1909 law of Illinois. Eight or ten states provide for a minimum cubic space per occupant, usually two hundred and fifty or four hundred cubic feet. Some twenty states require that factories shall be "ventilated" or "well ventilated" or "sufficiently ventilated". The cubic space requirement by no means insures good air conditions. It merely prohibits such a state of overcrowding that proper air conditions are im-

possible. Whether a factory with ample air space is comfortable or not depends on the further provision for air change. In the studies made by the English departmental committees it was found that the air was no better on the average in factories with over five thousand cubic feet of air space per occupant than in those with an air space under three hundred cubic feet. As to the provisions that factories must be "ventilated" or "well ventilated", they are unenforceable and meaningless in the hands of the present departments charged with factory inspection in this country. The Illinois law is the only real ventilation law in the United States. It provides that a definite amount of air, 1500 to 1800 cubic feet per occupant, according to specified conditions, shall be supplied, unless the cubic space in the workroom be over 2000 cubic feet per occupant and the outside window and door space be equal to one-eighth of the floor space.

In formulating a standard for factory ventilation one is met at the outset by the question whether the standard should be a mechanical or an analytical one. Ventilating engineers prefer to have the amount of air supply fixed as in the Illinois law. Sanitarians argue that the proper standard is the actual condition maintained in the workroom, however it may be reached. In a proposed law drafted in conference with members of this Association in New York a year ago and introduced in the state legislature as Senate Bill No. 1019, on March 31, 1911, an attempt was made to combine these two viewpoints on an alternative basis. This bill provided that "a workroom shall be deemed to be properly and sufficiently ventilated if the air in the working parts thereof does not contain more than nine parts of carbon dioxid in 10,000 volumes of air in excess of the number of parts of carbon dioxid in 10,000 volumes of the exterior air, or if there is constantly supplied throughout the interior of the room at least 1200 cubic feet of air per hour for each person therein present and employed and in addition thereto at least 1000 cubic feet of air per hour for each cubic foot of gas burned per hour". Such a law, which demands a reasonable rate of air change, to be demonstrated either by analysis or on a mechanical basis, seems eminently fair to the manufacturer and probably safeguards sufficiently the health of the worker so far as the extent of air change is concerned.

Any ventilation standard must, however, deal with the quality as

well as with the quantity of the air. The most important things are the temperature and humidity of the air. These qualities are measured very simply by the use of an instrument known as the sling-psychrometer, which consists of a pair of thermometers, one of the ordinary type and the other having its bulb covered by a wet cloth. Moisture evaporates from the wet cloth at a rate determined by the amount of moisture in the air and this evaporation cools the wet-bulb thermometer and lowers the temperature recorded. From the temperature of the dry-bulb thermometer and the difference between the dry and wet bulb, the moisture in the air may be readily calculated. A high wet-bulb reading means a combination of temperature and humidity, precisely the condition most harmful to the human organism, and Haldane has shown that in general a given wet-bulb reading has about the same physiological effect, whether it be the result of a very high temperature with low humidity or of a moderately high temperature combined with high humidity. The proposed New York law, to which reference has been made, provided that "the temperature in any factory workroom except a boiler room, shall not exceed 72° F. as determined by the wet-bulb thermometer, unless the temperature of the exterior air exceeds 70° F. as determined by the same process, in which case the wet-bulb temperature shall not exceed that of the exterior air by more than 5°." A wet-bulb temperature of 72° would correspond to a dry-bulb temperature ranging from 72° with completely saturated air to 93° with air containing only 30 per cent relative humidity.

It is just here that the difficulty comes in formulating a standard for factory ventilation. Either the Illinois law or the proposed New York law would serve pretty well to regulate the amount of air to be supplied. I do not believe, however, that we have adequate data for fixing a maximum figure for temperature and humidity. The limit of 72° wet bulb written into the proposed New York law was taken as a maximum which would probably not be onerous to the manufacturer, but it is possible that even this limit might be difficult of attainment in certain industries, while in most factories it is probable that a much more stringent regulation could well be adopted. Industrial processes are very diverse and any rigid statutory standard is likely to work hardship on the one hand and to give inadequate protection to the worker on the other. As Socrates long ago taught his ardent pupil Glauco in the *Mem-*

crabilia, it is no light matter to make laws governing industrial conditions. Standards for factories can only be wisely formulated after a careful study of existing conditions in the light of physiological ideals and by striking a fair balance between what we should like and what the factory owner can reasonably provide. In our own homes we maintain, not a wet-bulb maximum of 72°, but a dry-bulb maximum of 70°, a very different thing. How near this desirable ideal the legal limit should be placed can only be determined by a careful study of present conditions and practical possibilities in specific trades.

The old English law governing conditions in cotton-weaving sheds provided that in sheds in which there was artificial humidification the limit for carbon dioxid should be nine parts per 10,000, and fixed a definite relation between wet and dry-bulb temperatures for each dry-bulb temperature over a wide range, but set practically no upper limit for either. With the advance of modern ideas as to the supreme importance of temperature in air conditioning the whole question was reopened by the creation of a departmental committee which heard ninety-six witnesses, including physiologists, factory inspectors, mill owners and operatives, made seventy-six inspections and numerous air examinations, published the results in two hundred and fifty closely printed pages and formulated a new standard raising the carbon dioxid limit to eight parts in excess of that in the outside air and adding a temperature limit of 75° wet bulb. All this was done for one branch of one industry; precisely this sort of investigation is urgently needed in the United States.

In view of the difficulty of formulating legal standards, Wisconsin has adopted an entirely different plan, abandoning entirely the attempt to fix the details of factory regulation in the form of law and creating instead an industrial commission with power to fix specific standards whose reasonableness can be reviewed only by the supreme court of the state. The regulations of such a commission could be made far more responsive to the varied and changing conditions of science and industry, and would offer the most promising method of securing a maximum of protection for the worker with a minimum burden on the business itself.

It is quite as essential, however, for the work of such a commission as for the formulation of specific laws, if that method of pro-

cedure be preferred, that a thorough study of existing factory conditions by properly qualified experts should be made. There have recently been valuable studies of certain industrial poisonings in this country, notably by the Illinois Commission on Occupational Diseases and by Dr. Andrews, the secretary of this Association. General sanitary conditions, and particularly air conditioning, are far more important in the aggregate than these specific poisonings. The latter are obvious and spectacular, but they only affect a comparatively small fraction of the working class. Even in the pottery industry, one of the trades most subject to lead poisoning, it was shown in England by the departmental committee on this industry that the excess death rate due to plumbism was only .8 per 1000 while the excess death rate due to tuberculosis was 7.0. Industrial tuberculosis pervades not only the dusty trades, but in less degree every industry from the largest to the smallest. Yet as to air conditioning in our factories we know pitifully nothing and we have no machinery for finding out anything. New York has a good medical and laboratory expert in Dr. Graham-Rogers. Illinois has recently appointed a medical expert from whom we are to hear to-morrow. Massachusetts has a force of fifteen medical inspectors devoting some or all of their time to the work. This is all that we have in the way of scientific factory inspection in the whole United States. For progress in air conditioning it is essential to have air examinations and intelligent inspection of ventilating appliances in factories of various types. Only on the basis of such studies can legal standards be enacted or specific rules laid down by a factory commission. Yet we have in the whole United States, except for Dr. Graham-Rogers in New York, not one single chemist or engineer regularly employed by any state to study factory air conditioning.

Would it not be well for this Association to take up seriously at this time the problem of expert organization of the state bureaus which are supposed to deal with industrial hygiene and sanitation? It is less standards that we need than experts to formulate new standards and enforce the old ones. There should be medical experts and chemical experts and engineering experts,—not just doctors and engineers, but doctors and engineers who have specialized in public health,—on the staff of the body which enforces health laws in factories in every large industrial state; and we shall not get much farther with the problems on hand until this comes to pass.

Meanwhile, however, there is an excellent opportunity for the individual factory owner to benefit his employees and increase their output by attention to the problem of air conditioning as regards temperature and humidity. There should be a thermometer in every workroom and the foreman should be made to understand that every time the temperature passes 70° he is failing to secure the best work from his hands. In any large factory, observations of ordinary temperatures should be supplemented by the use of the sling-psychrometer. Only by such observations can window ventilation in small shops and ventilation systems in large factories be intelligently controlled. Direct practical results in diminishing absences and decreasing damaged and imperfect work have been obtained in many a factory by improved air conditioning. Efficiency methods have been applied to a hundred mechanical details of shop administration. That delicate mechanism the human body is, however, the underlying factor which is after all of most importance. Yet in many a workshop, perhaps in most workshops, the human body is being operated under conditions which preclude its maximum effectiveness, and the work suffers while the sanitariums fill up with cases of industrial tuberculosis.

AIR IMPURITIES—DUSTS, FUMES, AND GASES

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The nature and extent of air impurities discussed in this paper are dependent upon local conditions. For our purposes these air impurities may be classified under three heads: namely, (1) dusts, (2) fumes, and (3) gases. These divisions are not exclusive, as fumes in abundance may become dusts; for example, a sudden escape of white arsenic fumes results in a cloud of dust. Again, smelter fumes (mainly sulfur dioxid), much diluted, may be classed as gaseous. The classification, therefore, is neither specific nor dependent upon inherent properties of the materials. It is merely a convenience and must admit of a broad and liberal interpretation. A technical discussion as to proper lines of differentiation would be of little profit and less interest.

INDUSTRIAL DUSTS

It is well known that various industrial dusts cause irritation of the respiratory passages and of the eyes and skin of workmen. Such dusts may be considered in three classes: namely,—

1. *Insoluble inorganic dusts.*—This class includes metals (antimony, arsenic, type-metal, brass, bronze, copper, aluminum, iron, steel, lead, manganese, vanadium and ferro-vanadium, silver, tin, zinc, and solder) in a state of fine division (dusts, atomized metals, metallic powders); flue dusts; various ore dusts (iron ore, etc.); silica, sand, emery, flint, glass powder; carbon, graphite, diamond, coal, soot; brick dust, marble, granite, cement, terra-cotta; lime, gypsum, plaster, meerschaum; phosphates, guano, etc.

Fibrosis of the lungs may result from the inhalation of silicious or metallic particles; for example, we have “potter’s asthma” and “grinder’s phthisis” (chronic catarrhal bronchitis among knife-grinders). Pneumonia has been reported as frequent among workmen in blast-furnaces, in part owing, directly or indirectly, to the

inhalation of slag dust; cardiac dilation is said to occur among workmen in slate quarries; ankylostomiasis among brickmakers, miners, etc.; and recurrent inflammation of bone with hypertrophy among pearl-dust workers.

Hellthaler¹ has shown the high rate of death among various classes of metal workers in America who are apparently in ignorance of the peculiar dangers of their occupations; and Prinzing² has demonstrated the high death rate from phthisis among steel grinders and other workmen at Solingen, Germany, for the years 1885 to 1895. It is certain that the inhalation of iron dust may diminish in time the respiratory efficiency of the lungs through a loss in their elastic property; or may reduce the resistance of the organs to invasion by harmful bacteria; or may infect the lungs through a transportation of disease germs to places favorable for their inoculation. The disease known as siderosis exists commonly among metal polishers, knife-grinders, and others engaged in metal working. The earliest symptoms of this disease are, according to Soper,³ catarrh and bronchitis, but shortness of breath is pronounced by all authorities to be the most characteristic symptom. Eventually there follows what appears to be phthisis without the presence of tubercle bacilli, yet genuine infective phthisis is the most common cause of death. The effects may be delayed for years, but metal working is indeed a dangerous occupation; undoubtedly many die from infectious pulmonary diseases who do not know that the breathing of dusty air has led to their infection.

With the development of rapid transit systems in modern cities, it may be well to direct attention to a new and specific form of city dust investigated by Dr. Soper,⁴ who found that the average weight of dust in subway air was 61.6 mg. per 1,000 cubic feet of air, or 2.25 mg. per cubic meter. The figures for the streets were 1.83 mg. per cubic meter. The subway dust was found to consist chiefly of angular particles of iron, but no case of siderosis seemed to have been reported.

2. *Soluble inorganic dusts.*—This class comprises such substances

¹ Hellthaler, "The Death Claims." *The Independent*, December 27, 1906, v. 61:1560.

² Prinzing, *Handbuch der Medizinischen Statistik*, 1906, p. 489.

³ Soper, *The Air and Ventilation of Subways*, 1908, p. 205.

⁴ *Ibid.*, p. 200.

as are likely to be swallowed and absorbed, and includes: metal particles (lead, brass, copper, zinc, arsenic, mercury, and silver) and soluble inorganic salts. Many dusts of this class are dangerous, not only because of their irritating or poisonous properties, but also because of their inflammability,—e. g., potassium chlorate.

3. *Organic dusts*.—This class comprises sawdust, fur, skins, feathers, broom and straw, grain and flour, jute, flax, hemp, cotton, wool, carpet dust, street sweepings, tobacco and tobacco-box dust, hides and leather, felts, rags, paper, horsehair, etc.

As representative diseases caused by organic dusts we have: "flax-dresser's disease", a kind of pneumonia due to the inhalation of particles of flax; pneumokoniosis due to the inhalation of dust by gannister workers; alkaloidal poisoning from African boxwood by workmen engaged in shuttle making; and malignant pustule and a febrile disease among rag-sorters. As in the other classes, the components of this class of dusts are all irritating to the respiratory tract and to the eyes, and especially are they capable of forming inflammable, and even explosive mixtures with air. In addition, there are various trade eczemas, and anthrax has been frequently reported among wool-sorters.

The solution of the industrial dust problem presents many difficulties. Undoubtedly, however, disease from dust may be much reduced by the following procedures:

(a) Those engaged in the following occupations should wear "workmen-respirators": sorting rags in paper factories; workmen on threshing machines; millers; batch-mixers in glass factories; stone-cutters and sculptors; and all those working in factories where the air is contaminated with irritating or poisonous dust.

(b) Those employed in the manufacture of oxidizing agents and lead workers should be compelled to change their clothes before leaving the factory. This is done now in some works in this country.

(c) Glasses for the protection of the eyes of workmen should be looked upon as necessary in plants where irritating dusts are unavoidable.

(d) The dust on the floors of printing, type-casting, metal-working, and other establishments may be laid by means of certain useful preparations. Heise^a considers those consisting entirely of non-drying (mineral) oils to be the best for the purpose.

^a Heise, *Arb. Kais. Gesundh.—Amt*, 1909, v. 30: 93.

Where vapors are likely to occasion industrial poisoning, ventilation will serve to prevent their accumulation; but in the case of dusts, economic considerations often render such a procedure difficult except, of course, as the maintenance of normal ventilation assists in their elimination.

NOXIOUS FUMES, GASES, AND VAPORS

The air of cities and towns where chemical manufactories exist is often contaminated with noxious gases of industrial origin which are dangerous to the health of the workmen employed in the industries. The usual gases which give rise to complaint in manufacturing localities are the following: chlorin, which is emitted by pottery kilns and ceramic-products manufactories, and from plants for the electrolysis of halides; hydrogen chlorid, which is produced by the combustion of coal, and by pottery kilns, ceramic-products manufactories (partly from the coal and partly from the clay), nickel and cobalt smelting, platinum refining, glass manufactories, fertilizer manufactories, the chlorid of lime industry, and alkali manufactories; sulfur dioxid and sulfuric acid, which result from the combustion of coal, coke, petroleum, and gas, copper smelting, bleaching operations, etc.; fluorides and hydrofluoric acid, which are emitted from acid phosphate and heavy chemical plants; hydrogen sulfid, from chemical works, especially those which produce ammonia; carbon monoxid, which is emitted from iron furnaces and from copper smelters; organic vapors, from, for example, glue refineries, bone burners, slaughter and packing houses; zinc fumes from zinc smelters and from brass foundries; arsenical fumes from copper smelters; phosphoric fumes from match manufactories; and carbon disulfid and sulfur chlorid from some rubber works.

Lehmann* compiled the accompanying table from the reports of many investigators, to show at what concentrations the various common industrial gases are capable of producing immediate and observable effects upon health. The destructive action of fumes in the vicinity of chemical plants is generally due, however, to the presence of sulfurous acid, sulfuric acid, or hydrochloric acid; and this table is given on account of the occupational hazards on the part of workmen employed in chemical manufactories and smelters.

* Lehmann, *Methoden der Praktischen Hygiene*, 1901, p. 174.

NAME OF GAS		Rapid and dangerous injury	Bearable for 30 to 60 min. without grave effects	Trifling symptoms after action for some hours
Hydrochloric acid....per 1000		1.5—2	0.05	0.01
Sulfurous acid "	1000	0.4—5	0.05	—
Carbonic acid "	1000	About 30	6 to 8	1 to 2
Ammonia "	1000	2.5—4.5	0.3	0.1
Chlorin; Bromin..... "	1000	0.04—0.06	0.004	0.001
Iodine "	1000	—	0.003	0.005—0.001
Hydrogen sulfid "	1000	0.5—0.7	0.2—0.3	0.1—0.15
Carbon disulfid "	1000	0.01	0.002	0.001
Carbon monoxid "	1000	2 to 3	0.5—1.0	0.2

Of the gases which affect the respiratory passages and eyes the most important are the following: illuminating gas, gases from coke and coal; carbon monoxid; carbon dioxid (in brewing, baking, and the manufacture of aerated waters); chromic acid; chlorin; sulfuric, hydrochloric and nitric acids, and nitrogen oxids (in acid factories, heavy chemical works, engraving, etching, lithographing, etc.); mercury cyanid; heated lead; ammonia; naphtha and benzine (petroleum refineries and dry-cleaning establishments); arseniuretted hydrogen (copper refineries); sulfur, hydrogen sulfid, sulfur dioxid, and carbon disulfid, sulfur chlorid, nitrous gases, hydrocyanic acid; smoke (fire extinguishing); and the vapors of various organic compounds and substances (tar, creosote, carbolic acid, petroleum and its products, methyl alcohol, fusel-oil, varnish solvents, dinitrobenzol, nitroglycerine, formaldehyde and formic acid, pyridin, etc.). In addition to irritating the respiratory tract and eyes, such substances as the halogens, mineral acids, formic acid, alkalies, creosote and carbolic acid, various dyes, etc., cause injuries to the skin, giving rise to burns, eczema, fissures, ulcers, etc. It has been said that workmen in by-product coke plants, coal-tar color works, and in the roofing and paving industries are troubled with epitheliomatous cancer or ulceration of the skin or of the corneal surface of the eye, owing to constant exposure to pitch and tar compounds; that workers with chromates, tanners, and dyers have "chrome ulceration" of the skin; and that there are various trade eczemas, often of a troublesome nature.

Virtually no accidents have been recorded with hydrogen chlorid gas, and accidents with hydrocyanic acid gas and arseniuretted

hydrogen are not of frequent occurrence in American plants. Carbon monoxid occurs in colliery workings after explosions, in gas producers, blast-furnace gases, and in the manufacture of calcium carbid and phosphorus; hydrogen sulfid occurs in gas-liquor storage tanks, gas purifiers, sulfate stills and saturators, and in sewers; chlorin is found in and about bleaching-powder chambers, manganese stills, and Deacon and other chlorid plants; and nitrous and nitric acid fumes, which are very insidious in their action, are met with in vitriol chambers, especially in Gay-Lussac towers, during repacking and cleaning, in the manufacture of nitrate of iron and nitric acid, and in all breakages of vessels containing nitric acid.

The prevention of accidents and diseases among workmen in chemical and metallurgical plants is a subject which has received much consideration in England and Germany. From the experience in those countries we may conclude that the following preventive measures may be taken:—

1. In petroleum refineries, extraction rooms, ether manufactories, plants where inflammable liquids and vapors are likely to be present in the air, flour mills, and all other mills where inflammable dusts are likely to be wafted about or suspended in the air, the belts on all machinery should be treated with a suitable compound to prevent or minimize the possibility of static discharges. The other measures necessary for minimizing the fire risks are well known.

2. Workmen in plants wherein the air is contaminated with halogen, mineral acid, metal or other irritating vapor, should be required to wear "workmen-respirators".

3. Instructions should be given as to the use of oxygen and the methods of effecting artificial respiration. A very good description of such procedures is given in the *Chemical Trade Journal*, 1896, v. 19: 260.

4. Glasses for the protection of the eyes of workmen should be required in plants where acids or caustic liquids are used or made.

5. The plants should be well ventilated, in order to prevent the accumulation of gases and vapors.

A number of safety devices have been invented in Europe for workmen in chemical plants, and many of them have been found to be of great value. These cannot be considered here. It has also been statistically shown that a great many of the accidents in chemical plants happen on Mondays.

While we have not given as much attention in this country as we might to the subject of dusts, fumes, and gases in industrial establishments, the writer knows of earnest efforts on the part of certain large corporations to provide every precaution. One of the most difficult phases of the problem here is to secure the cooperation of the non-English speaking laborers. The American's appraisal of the value of a Dago's life, however, is associated not only with questions of financial economy, but also with the problem of how best to preserve the economic efficiency (health) of the individual. Prevention, reduction, and recovery are, therefore, of great importance as public health problems. Legislation is needed, but laws do not either enact or execute themselves and we must have sufficient appropriations for the determination of facts and the enlightenment of the public mind as to the effects of noxious industrial emanations.

EFFECTS OF CONFINED AIR UPON THE HEALTH OF WORKERS

GEORGE M. PRICE

New York State Factory Investigating Commission.

The air conditions in industrial establishments, which have an effect upon the health of the workers, may be classified in three divisions: (1) extreme variations in pressure, humidity and temperature; (2) dusts, poisons, gases, fumes, and infective bacteria; and (3) ordinary confined air. Of these three divisions the first two may be regarded as accidental to industries. The third division, ordinary confined air, is practically incidental to all indoor industries. The relative number of industries in which there is considerable variation in pressure, humidity, and temperature, or in which there is considerable danger from dust, poisons, gases, and fumes, is small in comparison with the industries in the establishments of which confined air prevails.

By the term "confined air" is meant air which is confined and vitiated by many impurities due to respiration, combustion, illumination, and overcrowding. In an examination of 4,850 establishments in New York State no means of ventilation, except by windows, was found in 88 per cent of the shops. The air in all these shops was confined and vitiated.

There is as yet a difference of opinion as to the exact nature of the toxicity of confined air. There is, however, no difference of opinion as to the dangers to health of a continuous and constant inhalation of such air.

It is not difficult to study the effects of extreme variations of pressure, temperature, and humidity of the air upon the health of workers in factories. Nor is it very difficult to trace the effects of specific poisons, gases, or fumes in the air, or to study the results of constant inhalation of certain kinds of dusts. The etiological relations between the accidental air impurities and the health of workers may be studied experimentally as well as clinically. The pathological lesions produced by most of these accidental impurities

are distinct and certain, and the diseases produced by them are either acute or chronic.

Not so with the effect of ordinary air impurities, which are understood by the term "confined air". The effects of confined air are less distinct, more difficult to prove, less direct, and more insidious, although not less deadly. Mortality statistics show that the death rate of workers in indoor occupations is much higher than that of workers in outdoor occupations. There is no doubt that the chief cause of this higher rate of mortality among indoor workers is the confined air of shops and factories. Aside from this, however, we have hardly any evidence in mortality statistics as to the effects of confined air upon workers. Confined air does not produce distinct pathological lesions, nor does it directly cause any diseased conditions; and therefore its influence on the death rate is difficult to prove. The best method for studying the effects of confined air upon the health of workers is to study the comparative morbidity rates of workers in different occupations who habitually breathe stale air in the course of their several employments.

The effects of constant and continuous inhalation by workers of the vitiated atmosphere of shop or factory will undoubtedly manifest themselves upon the general health of the workers, but more immediately and directly in the organs of respiration and digestion. Lassitude, fatigue, headaches, anorexia, anemia, indigestion, defective oxygenation, lack of vital resistance, and a predisposition to catarrhal affections of the air passages, are the inevitable results of a chronic intoxication by vitiated air.

The diseases, therefore, which we would expect to find among workers in vitiated atmospheres are bronchitis, anemia, and indigestion. Pulmonary tuberculosis and diseases of metabolism would probably be the sequelae.

In the effort to determine the effects of confined air upon workers it would be valuable to have a comparative table of the prevalence of anemia, bronchitis, and digestive diseases among workers in various indoor occupations. Unfortunately such data are unavailable in this country. The only way by which the facts may be gathered is by a physical examination of a large number of workers in different trades. It has, therefore, occurred to me that it may be of value to present some results of a physical examination of workers in

two different industries, which it was my privilege to conduct during the last year.

The medical examination of eight hundred bakers was made during last October by the New York State Factory Investigating Commission. The medical examination of six hundred cloak and suit makers was made by the Joint Board of Sanitary Control in the Cloak, Suit and Skirt Industry during the month of March. The bakers examined were those found in cellar bakeries in New York City; the tailors examined were those found in some of the best shops in the same city. We have also examined six hundred tailors in the worst shops in the East Side of New York City, but data for these are still unavailable. The accompanying table is very incomplete and no classification has been made according to age and sex.

The nativity and personnel of the bakers and tailors examined differed very little; their hours of labor were but slightly different though somewhat to the advantage of the tailors; night work is, of course, customary in bread making although a negligible factor in tailoring.

Dust was found in bakeries as well as in tailor shops. With the present methods of baking, however, the effect of the flour dust is unimportant as very little is allowed to escape. The vegetable and animal dust found in cloak shops was not sufficient in quantity to cause serious injuries. In the bakeries the temperatures near the ovens were rather high, but this affected only a comparatively small number of workers. The amount of CO_2 in bakeries and cloak shops does not differ very much. According to Dr. C. T. Graham-Rogers, who has made examinations in the shops of both industries, the amount of CO_2 in the air ranges from 6 to 25 per 10,000 volumes, and does not differ very much in the two industries.

The sanitary conditions of the cloak shops in which workers have been examined were exceptionally good, as these belonged to certificated shops in the industry. All the cloak shops examined were ventilated, however, by means of ordinary windows and, although not overcrowded, the ventilation of all the rooms was defective because the windows were closed and no special provision was made for introducing fresh air. The bakeries examined were all underground with no provision for ventilation except through small windows or gratings, but owing to the heated ovens the change of air was probably not less than in the tailor shops.

RESULTS OF THE PHYSICAL EXAMINATION OF 1413 WORKERS IN
CELLAR BAKERIES AND IN SOME OF THE BEST TAILOR
SHOPS IN NEW YORK CITY

	BAKERS		TAILORS	
	No.	Per cent	No.	Per cent
Total examined	800	100.0	613	100.0
Free from disease	347	43.4	115	18.8
Had the following diseases:				
Anemia	183	22.9	158 ¹	25.8
Asthma	21	2.6	9 ²	1.5
Bronchitis { Acute	177	22.1	19 ³	3.1
{ Chronic			36 ⁴	5.9
Laryngitis			5 ⁵	0.8
Pleurisy	2	0.3	4 ⁶	0.7
Tuberculosis { Positive,	19	2.4	4	0.7
{ Suspected			7 ⁷	1.2
Diseases of the digestive system	76	9.5	186	30.3

¹ Of the 158 who had anemia only 31 had no other disease; of the 186 who had diseases of the digestive system only 36 had no other disease; the others had one, or more than one, other disease.

² Five of these had chronic bronchitis and are included in that list.

³ One of these had tonsilitis and is included under diseases of the digestive system.

⁴ One of these had pharyngitis and is included under diseases of the digestive system.

⁵ One of these had chronic bronchitis and is included in that list.

⁶ Two of these had chronic bronchitis and are included in that list.

⁷ All of these had chronic bronchitis and are included in that list.

Total number of diseases among the tailors, about 950.

Total number of tailors, 613.

Ratio of diseases to tailors, 15.5:10.

We have no statistics in this country with which to compare the results obtained by our physical examination. We thus have no standard by which to judge the variations in the morbidity rate. Nor can a comparison be made with the morbidity statistics of Sommerfeld and others gathered from the German sick funds (*Krankenkassen*), for the reason that these morbidity rates are given mostly for those members of the sick-fund societies who are unable to work. Dr. Sidney I. Schwab's figures of the prevalence of neurasthenia among tailors,⁸ and Dr. Waters' claim of the large percentage of tuberculosis among tailors, may be referred to here as the only figures available on the morbidity of tailors.

The standard mentioned by Hoffman of the incidence of 15.5 diseases to ten persons, being the German rate, can be compared to the 950 diseases for the 613 tailors examined, which makes a ratio of 15.5 to 10.

The large number of bakers suffering from bronchitis, in comparison with the number of tailors suffering from that disease, seems to indicate the better sanitary conditions of the tailor shops, which, as has been noted above, belong to those that have received sanitary certificates from the Joint Board of Sanitary Control. On the other hand, the comparatively large number of digestive diseases among tailors may perhaps be due to their stooping posture and to their lesser muscular activity as compared with bakers, who are always on their feet and who change the character of their work a number of times during the day, while tailors sit at a machine for nine hours a day with only a single interval for relaxation.

It seems to me that the comparatively high percentage of anemia, bronchitis, and digestive diseases noted among both the bakers and the tailors is at least suggestive of the defective ventilation of the shops in these industries, and that the confined air which bakers and tailors are compelled to breathe habitually has a strong etiological relation to these diseases. Much more intensive and extensive study of the subject is necessary, however, before the relation of confined air to the health of the workers can be definitely determined.

⁸ Publication No. 12, American Association for Labor Legislation.

GENERAL DISCUSSION

MR. J. T. AINSLIE WALKER, *New York City*: I have listened with great interest to the papers read this afternoon. Speaking as an Englishman, having been in this country but a few months, there is one phase of this problem which you do not consider as fully as I had hoped. We have heard of the precautions to secure proper ventilation, but the last speaker has dashed our hopes by stating that in many instances among tailors and bakers confined air is almost essential. To consider ventilation alone is not enough; we must deal with the presence of dust on all workroom floors. This problem has received attention at home and I hope soon to see it properly handled in this country. I know of no finer institution to take up such work than this Association.

I think we all agree, also, that if this problem is to receive proper attention we must have the assistance of the manufacturers. There is no use in trying to force them to do what we want, but we must try to persuade them. If the moral argument is not sufficient, the best inducement is the one that appeals to the pocketbook. The best that a man can do in a day is one hundred units of work. Suppose a manufacturer is employing one hundred workmen. If you represent to him that, by neglecting certain precautions which you can show him how to handle successfully and economically, the loss of work and fall in efficiency is ten per cent, you have a direct argument to place before him. He sees that among one hundred workers a lowering of ten per cent in efficiency means that he is losing the work of ten able-bodied men every day. If this argument is put before the American manufacturer, as it has been successfully put before the English manufacturer, I think he will listen to you. You are more likely to achieve success this way than if you appeal from a moral point of view.

A year or two ago an English doctor, bearing the famous name of Lister, called attention to the high death rate among printers. The attention of the federation of printers and allied trades was called to it by myself, and they decided to investigate the question first-hand. A certain area of floor space in one of the largest establishments in London was chalked off. One-half was sprinkled with a disinfection solution; the other half was sprinkled with

water. Swabs were taken over each of these spaces and the contents examined. On the plate which was from the section sprinkled with water only there were crowds of bacteria; the other plate showed no colony of bacteria. Thus the disinfection was shown to be satisfactory. The publication of this result in the textile papers and trade journals had a marked effect on the minds of manufacturers in England.

MR. MEHREN, *New York City*: We are engaged in efficiency engineering work, the improvement of factory conditions in order that the output may be the maximum and that the manufacturer may have the least possible cost and the worker the highest wage. From that standpoint the efficiency of the men is a very important consideration. We go to the manufacturer and say, "Betterment works of all sorts are not philanthropies; they are profitable investments." We have not gone into chemical factories and consequently much said this morning about the lead industry went over my head, but we have been able to make valuable use of efficiency tests. We found a short time ago a large establishment with fifteen hundred employees in which the manufacturers knew they had not full efficiency, although they had not been able to put their finger on the cause. We found that the ventilation was bad and that the common drinking cup had propagated colds in winter. Why not call in to aid the campaign for industrial hygiene the efficiency engineer, who is directly studying factory conditions with the idea of improving them? Legislation, strict enforcement of law, will produce much good. But the greatest result will be accomplished when you take advantage of all possible methods, one of which is to enlist the cooperation of the consultant in the engineering world.

DR. LEONARD W. HATCH, *New York Department of Labor*: This point has come to my attention as bearing out what was said of the value to the manufacturer of medical care of his employees. A certain small New York plant employing two hundred and fifty people is quite a model establishment so far as ventilation goes. The firm established a benefit system and in connection with that a plan for giving the employees medical attention. It was arranged that a physician, employed by the firm, should be at the plant every day at five o'clock, and anyone who was employed there could con-

sult the physician by making his desire known to the watchman or porter. At five o'clock all who could be attended to that day were notified by the watchman. After a year's experience the head of the firm stated that, though they had never kept records of the time lost in previous years, he was sure that, even in that period, without any special hazards, they had saved enough of the workers' time to more than pay the cost.

MR. PAUL KENNADAY, *Secretary, New York Association for Labor Legislation, New York City*: We have heard that it pays to keep the workmen well. In this Association we want to take the view that it is *just* to keep the workmen well. We should go to the labor unions, get out on the stump, use the newspapers, and teach the industrial population that they should keep themselves well for their own benefit and not to increase any dividends. And then, having aroused that feeling among them and a certain amount of enthusiasm, we should get after our state labor departments and get them to do their duty. Many are doing excellent work and many are not doing anything at all. They should make investigations into continuous processes, and give us the facts in regard to the number of men who are working seven days a week and the effect of such work on their health. At present we have no such facts. As one member of the Association I say, let us emphasize a little more strongly the fact that it is justice we are after and not the payment of higher dividends.

DR. LEE K. FRANKEL, *New York City*: I have been reminded of an old story about barking dogs that never bite. I suppose you know the story of the man who was running away from a dog. His friends told him, "Barking dogs never bite." But the man replied, "You know it and I know it, but the dog doesn't know it."

The discussion here has centered largely around what might be done in the direction of preventing disease through efficient legislation and by the employer of labor, but nothing has been said about what can be done by the workman toward safeguarding his own health. I want to mention what has been done in the city of Vienna, where there is a federation of sick clubs, under the Austrian government, which records every disease that occurs among its members, and these clubs practically comprise every workman earning a cer-

tain income. Every member realizes that it is for his distinct advantage to report the conditions that exist in the factory where he works, particularly with reference to accidents. The result is that in the central bureau there is a careful record of every industrial establishment in the city of Vienna reported under the very best form of factory inspection known, namely by the employee himself, and by moral suasion without the necessity of legislation. These clubs have gone to the employer who has not introduced proper safeguards against accidents, or who has not put his mill or factory in good sanitary order, and have shown him that his establishment is below the standard, or proved to him that more accidents occur in his establishment than in those of his competitors. By this method they have been able to raise the standard exceedingly. Lacking compulsory industrial insurance it seems to me that, if this problem were taken up by our labor organizations, they could institute a system similar to that in vogue in Vienna and bring home to their employers the need for putting their factories in proper condition.

MR. MILES M. DAWSON, *New York City*: There is no question in my mind but that wherever there is a system of insurance, contributed to by both employer and employee, in addition to the collection of reliable information, there is the further result that attention is given to the subject by both sides. The benefits of sickness insurance in guarding the health of employees in Germany are doubtless great. This has reference quite as much to accidents as to illness. It is, therefore, unfortunate that so far, during the brief development we have had of workmen's compensation in this country, there has been no extension of such insurance. We would not only have done better work in connection with workmen's compensation, but would have indirectly had means of determining what the facts are concerning industrial diseases and industrial accidents, if we had adopted the plan in force in many countries of sickness insurance societies.

MR. JOHN MARTIN, *New York City*: Professor Winslow said, and so far as I have been able to read the literature on the subject it seems to be agreed, that practically the only factor in ventilation about which we are positive is that overheating is detrimental to health and vigor. He went on to argue that that was a sufficient

reason for declaring in favor of an artificial system of ventilation; because, he said, if your factory or schoolroom is overheated, evidently the thing to do is to force in air, but it must not be below 60° F. when it enters. That logic, which I think is commonly enunciated by ventilating engineers, seems to me defective. If the factory or schoolroom is overheated, the common-sense, obvious remedy is to *turn off the steam* and reduce the heating surfaces.

As a matter of fact in this country we have for some years been convinced of the desirability of having rooms occupied by human beings, particularly hotels, trains, factories, and schools, kept at something above the outside temperature in winter and, with a national tendency to overemphasis and exaggeration, we have gone to the length of making about 75° or 80° F. the standard indoor temperature in wintertime. Manufacturers and school authorities are literally killing with kindness. We have installed elaborate heating apparatus, and we use up coal in the most lavish manner, with the result that we are creating greater loss than we are avoiding. Now the remedy for that, it would appear, is not to discard heating apparatus but to install another apparatus to offset the one you have already installed. Surely the manufacturer might more reasonably be told, "You can save your earlier expense; you need not install so many radiators; you are damaging your employees, as we are damaging our school children, by this mistaken kindness." To my mind, the thing to do is to teach the employees to throw the windows open.

MRS. IRENE OSGOOD ANDREWS, *New York City*: I want to say a word as to the relative value of protection from bad ventilation and protection from disease. Ventilation is a much bigger problem and covers a larger number of persons, and we should be delighted to know what to do about it. We knew, after some study, what was an effective remedy for phosphorus poisoning; we knew after a while about compressed-air illness, about lead poisoning, and something about blindness from wood-alcohol; but we don't know what to do about ventilation. Illinois passed in 1909 perhaps the most effective law, yet I am told that it is only indifferently enforced. The occupational disease law passed last year has met with greater success. Massachusetts has had medical inspection of factories for six years, but Massachusetts has no standard for ventilation. New

York has had medical inspection for four years, but has no standard for ventilation. Those of you who are familiar with New York conditions know that for three years we have been having conferences on ventilation. Last year a bill was proposed and this year the experts disagreed entirely and the bill was cast out. Anyone who can give us information on how to handle effectively and enforceably this subject of ventilation awaits a place in the hall of fame. We hoped that might be one outcome of the meeting here.

Dr. Frankel has told us what the workman can do. Austria has been behind other foreign countries. But, as an illustration of its recent progress, although fourteen countries have prohibited the night work of women, the period of rest being between ten at night and five in the morning, Austria has now taken the advanced stand that the rest period is to come between eight at night and five in the morning. Before we can expect much of the workman we must have a strong body of labor law back of what we expect him to do. I see no reason why the conditions which Mr. Pratt showed us this morning in his pictures of lead poisoning should not be removed before we ask the workman to protect himself. I think that must be the line of progress in this country.

DR. C. T. GRAHAM-ROGERS, *Medical Inspector of Factories, New York*: I think the subject of ventilation has been pretty well covered by those who have discussed it, and I do not feel that I can add much. It is true that experts on ventilation, instead of agreeing, have disagreed, and that the whole subject is in rather a chaotic state, probably because there has not been strong enough cooperation on the part of engineers, physiologists, medical men, and factory workers to get results. There are so many factors entering into the question that I doubt if six months or a year will give us much of a clue to its solution. It will take several years of intensive investigation. But we cannot have any standard ventilation for all industries; each industry stands by itself and in each intensive research must be pursued. We shall get results, not now, but in the future.

PROFESSOR C.-E. A. WINSLOW, *New York City*: I hope very much that this Association will take up specifically the problem of ventilation. If the Association could get experts, men qualified to take up these problems, it would mean a great deal of work and time, but the results would be of great value.

I face the logical conclusion: If the only problem is overheating we can do without ventilation. But aside from the heat question we have to change the air in order to remove the odors, the dust, and the fumes. Whether they hurt or not they have to be removed. And we have to have tempered air. In a hospital you can do what you want with patients, but in a factory you cannot have the people making complaints, so the windows have to be shut, and I doubt if it would conduce to the efficiency of the industrial worker to do otherwise.

MRS. FLORENCE KELLEY, *National Consumers' League, New York City*: One point has not been clearly brought out in the discussion of poisonous trades and occupations. We were shown this morning pictures of common laborers shoveling lead, filling the air with dust in its most poisonous forms, for themselves and for everybody else to breathe, and to my lay mind it was a most horrifying spectacle. I do not know much about it, but I had not had a conception that there were men who would do such work, especially when it is not necessary in this or any other country. Would it not be possible to have the officials of a state where the lead industry is carried on publish the pictures and an explanation of apparatus in use by standard concerns, which eliminates the poisonous process, so the workman could be intelligent in his choice of occupations? Could not that knowledge be spread among the people so that where there is in actual use a successful mechanical method for the elimination of poison there need no longer be any excuse for the primitive process?

DR. DAVID L. EDSALL, *Harvard Medical School, Cambridge*: There is one thing I should like to say in relation to a subject of which Dr. Cabot spoke. It is important that hospitals keep records and that physicians be trained. The hospital records, if available, would be the best thing we could have. At present it is impossible to get any satisfactory facts which are precise enough to amount to anything. Except a careless name like "laborer" to describe a dozen different occupations, we find nothing to indicate what a man is doing. Hospital physicians need to be urged to contribute their share to the solution of the problem of industrial diseases.

Hospitals should also have exhibits which they could use to teach

the patients themselves what they should do. Undoubtedly one of the best effects of the German insurance laws has been their effect on health, and one of the most important ways in which they have affected health has been through the graphic education they have given. The education that has spread among the people as to right methods of living has been one of the most advantageous things the country has had.

The hospital must be looked upon as one of the centers for spreading information in regard to hygiene. I do not see any reason why our hospitals should not spread a great deal more information than they do on health matters.

DR. WARREN COLEMAN, *Chairman*: In Bellevue and no doubt in the larger hospitals of the country, the physicians themselves take little or no part in acquiring sociological data concerning the patient. At Bellevue we have our bedside card, one side giving the sociological data and the other the bedside data. The sociological data is filled out in the lower office by an untrained person. That could be corrected, but they are not disposed to pay salaries to trained persons for that character of work.

Again, there is no nomenclature to which we can turn to determine what a man's occupation is. A committee has been appointed for the purpose of getting up such a nomenclature. It will be a heavy task, but in the course of perhaps a year or two years we shall probably have some such thing. Not long ago a young man came into my ward as a patient. He was sixteen and gave his occupation as lithographer. I thought I would cross-question him and find out just what he did. I found he swept the floor in the lithographing room and in winter swept the snow off the sidewalk; yet he had gone down on our records as a lithographer. There are many other similar points to which I could refer.

DR. JOHN B. ANDREWS, *Secretary, American Association for Labor Legislation, New York City*: The medical profession can furnish us with information which we can spread broadcast in the form of leaflets among the workers and employers. Professor Thompson of New York has prepared a leaflet on lead poisoning which he has been using in his hospital work and from which he is getting interesting results. Why cannot that plan be worked out in every hospital?

There was a second point that I hoped Dr. Cabot would emphasize,—the establishment of special clinics for the prevention and cure of occupational diseases. We have such a splendid illustration in Milan, where they have three buildings with hospital wards, laboratories, clinics, etc., especially devoted to this subject. I hope that within the next ten years we shall have in this country half a dozen of these institutions. It may be necessary to begin the work with general hospitals and I think Dr. Cabot and Dr. Edsall will be among the first men to superintend such plans. We must have medical men with the tools at hand working all the time supplying information for the prevention of these industrial diseases.

IV

STATE PROMOTION OF INDUSTRIAL HYGIENE

Presiding Officer: HENRY W. FARNAM
Yale University
NEW HAVEN, CONNECTICUT

EDUCATION FOR THE PREVENTION OF INDUSTRIAL DISEASES

M. G. OVERLOCK

State Inspector of Health, Massachusetts.

Standing to-day at the very portals of a vast field of opportunity, I can see stretched before me a decade of achievement in human efficiency unparalleled in the history of the world. Your organization has tilled the bare edges of this field, and the fruits of its labor has attracted the attention of every student of human events. The mighty stride of our industrial and commercial America is the wonder of all the nations of the earth. And the superior skill of our American workmen is attested by the fact that, although the machines of the American Shoe and Machinery Company are scattered throughout Europe, shoes made upon the same machines by American workmen are still eagerly sought, because of their superior finish and workmanship, by Europeans.

The maintenance of human efficiency at its highest standard must be the watchword in the next decade. And, if kept at high-water mark, it will rebound to the credit, satisfaction, and glory of those who have to do with and who bring about the application of tried and found-true principles of personal hygiene for the avoidance of industrial accident and industrial disease. The prevention of such diseases must be brought about by a systematic course of education, with the cooperation of the numerous agencies at our command. These agencies, taken in the order in which in my judgment they belong, should be: first, medical colleges; second, industrial clinics; third, industrial hygiene exhibits, both traveling exhibits and museums; and fourth, publicity by means of lectures, leaflets, and posted warnings. Laws drawn up for the protection of working people from disease are themselves, moreover, educational, and employers can do much to assist the movement.

I. MEDICAL COLLEGES

At the present time an opportunity presents itself to the medical colleges of this country which is most opportune. If these institutions of learning will add to their curriculum a department for the diagnosis and treatment of industrial diseases, they may be, by their cooperation with boards of health and bureaus of factory inspection in the various states in which they are located, a potent factor in impressing upon the different legislative bodies the need for proper health legislation and for proper appropriations to carry out this work. Medical men thus trained, reporting all industrial diseases to the central body and keeping in close touch with the boards of health and bureaus of factory inspection in different states, may by this cooperation be of immense value to that great army of workers whose occupations make them susceptible to industrial diseases.

What is the legislation necessary to bring this about? To my mind the system under which we are working in the state of Massachusetts should be in vogue in every state in the union. Every state should have medical men as state inspectors of health, working under the direction of a state board of health or bureau of factory inspection, and reporting their findings to the central health authority. It is my candid opinion, and I feel that it is also the opinion of the physicians generally throughout Massachusetts, that the act creating the state inspectors of health and setting forth their duties was a most important legislative action. For it is well to remember that they are the only large body of physicians on this continent who, acting in the capacity of state health officials, study the health, including the moral, social, and physical habits of the people, within and without the factory. Their investigations include, among other things, an inquiry into cleanliness, ventilation, the condition of the air, eyestrain, temperature, artificial moisture, the proper removal of dust, a proper system of lighting to avoid injury to the eye, pure drinking water, receptacles for expectoration, excessive humidity in textile industries, exposure to extreme heat in laundries and foundries, and exposure to lead and other industrial poisons,—in fact, a scientific study with a view to the elimination of all causes which lead to industrial disease. Those of us in the field feel that we are working under the direction and careful scrutiny of those who have made the prevention of disease their life study and who are ever willing and anxious, so far as the means at their

command will allow, to make scientific application of every health principle.

I believe that the emulation by every state in the union of the methods now in vogue in the state of Massachusetts will, within a decade, produce results of which this nation may be justly proud. Then, as I said in the beginning, the medical colleges, by their co-operation with the state boards of health and bureaus of factory inspection, could with profit to themselves and to the community and the state, turn out men whose training would aid greatly in the reduction of industrial diseases. Because it is plain that these colleges, using the deductions made from the experience of the state health officers in the field, would be working on facts and not on theories.

II. INDUSTRIAL CLINICS

The results and experience at Milan, Italy, and the opinion of medical men who have followed this clinic and its workings show, I believe, that we should have an industrial clinic in each of the large industrial centers of the United States. This seems to me an excellent opportunity for our philanthropists, but it could also, in my judgment, be taken up with benefit and propriety by the United States government. The money thus spent would make for efficiency in our industrial life, would be conducive to a greater degree of health among the industrial classes, and would be of inestimable value to the millions yet unborn. I therefore suggest that the Association for Labor Legislation, by the appointment of a proper committee, take this matter under advisement.

III. INDUSTRIAL HYGIENE EXHIBITS

As I said in the beginning, this campaign for the betterment of the condition of the man or woman who works, to be efficient and far-reaching, must necessarily be a campaign of education. I feel sure that you will agree with me that the traveling exhibits, particularly those which have been sent out by the Boston Association for the Prevention of Tuberculosis, as well as those from other cities and states, have been of immense educational value and have left a strong impression upon the lay mind, as well as upon the minds of members of the medical profession and of social workers,—in fact of all who visited these different exhibits. It would seem to me that we might establish an industrial hygiene exhibit which could be

sent from city to city and which would have a stimulating influence upon those at the head of industrial establishments, who have an opportunity to provide sanitary conditions in modern up-to-date factories. It would also bring to the laboring man the realization that, after all, the scientific application of the principles of sanitation and hygiene are being worked out for the betterment of the working class.

Such an exhibit would have another effect. It would ask a question of the landlord who is renting insanitary and ill-kept dwellings to the working classes. This question in substance is: If the manufacturer furnishes excellent sanitary surroundings for working men and women ten hours a day, why should I not furnish tenements with equally healthful conditions and surroundings for these people during the remainder of the twenty-four hours? In fact, in Massachusetts, with its rigid enforcement of factory laws calling for proper light, cleanliness, removal of dust, pure drinking water, receptacles for expectoration, and numerous other health measures, the question is often asked: "Why have we not a tenement-house law that will place the conditions of the home on a par with those of the factory and shop?"

Such industrial hygiene exhibits might be brought together at some central place, thereby forming a museum which could be visited by those anxious to learn just what is being done for the man and for the woman who works.

IV. PUBLICITY THROUGH LECTURES, LEAFLETS, AND POSTED WARNINGS

In 1908, in the eleventh health district in my state, I began a series of noon-day talks in the different large manufacturing establishments, particularly those located in the city of Worcester. If I may speak without egotism, I believe that these talks were of immense educational value. They were given in lay language on questions of personal hygiene and sanitation, including the use of pure air and the importance of proper exercise, diet, and rest. These lectures were largely attended. I have in mind at this moment one establishment employing at that time twelve hundred women where, when a notice was posted a few days in advance that this talk was to be given, nine hundred remained at the factory during the noon hour to listen to what they must have considered a question pertinent to

their welfare and well-being. In a number of instances manufacturers shut down at half past eleven o'clock to allow their employees to attend my lecture without its interfering with their noon hour. During these lectures I usually distributed a little circular on "Don't", setting forth briefly, and recommending the avoidance of certain habits detrimental to health. These little leaflets were eagerly sought for; I believe they were carried home; and perhaps the suggestions were followed. At any rate, I had the satisfaction of knowing that I had set the people to thinking. Since that time I have been pleased to learn that these lectures have been delivered in several other states.

It is my opinion that the posting of warnings, whenever this can be brought about in large industrial establishments, will be prolific of much good, as they readily attract the attention of all the employees and at least set them to thinking as to their meaning. I also feel that an excellent means of educating the industrial worker is by the distribution of leaflets through the different trade-union organizations. A great deal of good can be brought about in this way, and especially effective work may be done by calling the attention of the employee to the ordinary care needed in the handling of articles or chemicals which might in numerous instances be conducive to the production of poisoning. For example, attention may be called to the need of ordinary care in preventing lead poisoning. These leaflets, gotten up in a plain, readable manner, and printed in the several languages used by the employees in the different industries, might be made of great educational value.

V. VENTILATION AND EYESTRAIN LAWS

In Massachusetts the law covering the ventilation of factories and the installation of mechanical ventilating apparatus (Chapter 106, Secs. 51 and 52) has, I believe, brought into play factors which tend in many instances to the maintenance of bodily resistance, as well as to the prevention of many industrial diseases. This law provides that "a factory in which five or more persons and a workshop in which five or more women or young persons are employed shall, while work is carried on therein, be so ventilated that the air shall not become so impure as to be injurious to the health of the persons employed therein and so that all gases, vapors, dust or other impurities, injurious to health, which are generated in the course of the manufacturing process or handicraft carried on therein shall, so

far as practicable, be rendered harmless." Should elements detrimental to the health of the employees be found in any of these factories or workshops, the state inspector of health may require the installation of mechanical ventilating apparatus. In any instance where much dust is generated, if it appears to the state inspector of health that the inhalation of such dust would be substantially diminished without unreasonable expense by the use of a fan or other mechanical means, such fan, if he so directs, must be provided, maintained, and used. In all of the dusty trades, as well as in rooms which are close and poorly ventilated, the installation of fans and blowers has had its effect upon the health of the employees. The enforcement of this statute does away with vitiated and foul air, to which otherwise the employees must be subject.

Numerous examples of the practical working of the law might be given if space permitted, but in passing I will mention two. In the basement of a large manufacturing establishment, where about forty men were employed, the air, which appeared damp, was heavy and charged with carbon dioxid, and the men were continually suffering from colds. The installation of two small fans and the covering of several emery wheels, which were provided with suction pipes, clarified the atmosphere to such an extent that the men told me they felt as if they were working in the open air as compared with the conditions under which they had worked before this apparatus was installed. They said that they had fewer colds, that they felt more like working, and that they could do better work without getting tired. In other words their physical condition underwent a change almost immediately after the installment of the apparatus mentioned and the removal of the foul and heavy air.

In another instance, in the weave room of a large cotton mill where about forty girls were employed, the air was close and heavy, the girls went about their work in a listless manner, and hardly a day elapsed during certain seasons of the year but several of them were out on account of not feeling well. After the installation of a large fan, which removed the dust as well as the overheated atmosphere and allowed fresh air to take its place, a change was immediately brought about which was at once noticeable to the eye of the inspector. There was less absence from work, denoting, of course, less sickness among the employees, and the manner in which they applied themselves to their work showed that a higher degree of

efficiency was being maintained, and that their general health was much better.

Massachusetts, I believe, is the only state in the union which has passed any act relative to injuries to the eyes of those employed in industrial establishments. This, I believe, is an excellent law and will do away with many cases of eyestrain, of headache, and of nervousness, which arise from improper lighting of the rooms in which people are employed. In going into this question, we look first to the natural light and attempt to bring about, by a careful study of the different establishments, the best condition obtainable from natural light. The question of artificial lighting, the kind of light and its effect upon the eyes, is next gone over, and the best light which our experience and judgment dictates is ordered installed. In many instances simple washing of windows and orders as to their care have wrought a wonderful change. In others, the placing of more windows in such a position as to give the best possible light has proved beneficial. Then again, the whitewashing or painting white of the walls and ceilings of many rooms has made a change in the condition of the eyes of the employees. On entering one of these establishments, we first determine the kind of work, whether it needs close application of the eyes or not, whether many of the employees are wearing glasses and, if so, why they are worn, and then we determine the effect of the artificial light or the rays of light admitted to the room upon the eyes of the employees. Questions are asked as to the length of time employed in the present occupation, the condition of the eyes previous to this employment, and the difficulties, if any, under which the employees are working.

As this law is new, and as many changes in the lighting of establishments are being made throughout the state, we are as yet unable to judge of the beneficial results which we hope to obtain. From my personal observation, however, I believe this to be an important step which the state has taken, and I believe that eyestrain and kindred industrial diseases, which heretofore were caused by inadequate and improperly lighted rooms, will be done away with to a large extent. There is no doubt in my mind that many internal disturbances, particularly what is known as dyspepsia or nervous indigestion, which is in many instances the result of eyestrain and which has become distinctly an industrial disease, will be done away with. If this be true, it is plain that the general condition of the

worker must be bettered. Physicians, of course, have for a long while realized that much malnutrition and consequent general weakness has been brought about by eyestrain. And no one whose occupation requires close application to fine work can escape its deleterious effects and its consequent influence over the general nervous system. This, of course, leads up to the whole question of industrial disease as related to the eye. In comparing notes with the several inspectors of health throughout the state, we can arrive at but one conclusion and that is, that the judicious application of this statute will be rich in beneficial results to the industrial worker.

VI. EMPLOYERS' TUBERCULOSIS AGREEMENT

It is said that all medical men have hobbies. I believe once in a while, however, the laity credit us with entertaining practical ideas. Appointed state inspector of health in 1907, with instructions to inspect and examine minors in various industries throughout my district, I knew I should find tuberculosis. I reasoned that in the vast majority of cases, when I found this disease in a boy or girl, I should also find that they did not have the four dollars a week required of all who would enter a sanitarium, even if such opportunity was open to them. I have since found it to be a fact that more than ninety per cent of the workers, when stricken with this disease, have not saved for the so-called rainy day. After one of my noon-day talks a young girl approached me saying that she had listened to the hope which I held out to those having tuberculosis that they might be cured if sent early to a sanitarium. She told me that she had tuberculosis but that she had an invalid mother whom she must support, and that she had no money. I took up this case with the president of the company for whom she worked, and he not only assured me that he would pay for this girl, but that he would pay for any other of his employees who might be so stricken. I asked him if he would give me a letter to this effect. He did, and I then saw a vast field opened before me. I went to other manufacturers, asking for the same pledge, and in a short time I obtained more than a hundred similar pledges.

This was the starting of what the *Survey*, in April, 1910, saw fit to call the "Overlock Tuberculosis Agreement". This movement quickly spread throughout the city of Worcester and the surrounding towns. It attracted the attention of the Boston Chamber of Commerce, which body, by accepting a year later a recommendation of

their committee on the prevention of disease, adopted it without a dissenting voice. Boards of trade and merchants' associations throughout New England took up the matter as bodies. The movement has spread from city to city and from state to state, until I find, by conferring with my coworkers in different states, that this agreement at the present time protects more than a million people.

In a year's time, moreover, the work which I had done began to bear fruit in a different direction, which I had not anticipated in the beginning. Young men and women were sent to sanitariums, into the country, and to their homes across the sea, and were then sent back as arrested cases to become teachers in sanitation and health matters. At the present moment I think I can say that there are in different parts of New England and the eastern states more than five hundred cases under treatment, the expenses of which are paid by their employers. My hope now is that this movement may spread throughout the United States.

This movement, outside of its humanitarian and economic features, has set the manufacturers to thinking. They began at once to reason, first, as to why they should have tuberculosis among their employees; second, as to whether, if it did occur, it was because of the surroundings under which they were working; and third, what were the steps necessary to place their different establishments under a sanitary regime and to remove as fast as possible all causes which lead up to the lowering of vitality and resistance in their employees. They soon learned, also, that by placing their establishments in the best possible hygienic condition the efficiency of their employees was increased. I have been much gratified in the past three years by the whole-souled cooperation of the manufacturers in this movement. They at once began to extend the welfare work, in their several establishments, so that at the present time not only do many of the large establishments provide recreation halls, but they are serving the noon-day meal at its bare cost. This sentiment existing among the business men of a community must necessarily have its effect upon the whole community. The local health authorities, who in too many instances in the past have been sadly remiss and dilatory in the manner in which they enforced laws, have had it pointed out to them that they must cooperate in matters pertinent to the health of the community.

The steps taken for the eradication of tuberculosis from industry

are the very steps which must be taken for the prevention of industrial diseases in general. This movement, in the localities in which it has been applied, unites, we find, all sects, all creeds, all schools of medicine, in one common brotherhood. Your organization, acting in conjunction with the organized forces which I have mentioned, may be a most potent factor in bringing about the cooperation of the various agencies needed in the campaign of education for the prevention of industrial diseases.

NOTIFICATION OF OCCUPATIONAL DISEASES

CESSY L. WILBUR

United States Bureau of the Census.

The notification of occupational diseases has a somewhat similar relation to the registration of deaths from occupational diseases that the notification of births has to the registration of births. Notification in each case—and to be entitled to be considered real notification it must be immediate—is for the purpose of giving the earliest possible information to the authorities charged with the supervision or control of the class of events. Immediate notification of births is chiefly for the purpose of enabling the sanitary authorities to insist upon the necessary precautions for the prevention of ophthalmia neonatorum and of infant sickness and mortality. It is not intended to replace the registration of births, for which a reasonable interval must be allowed, at least in rural districts; but it may serve as an important aid in securing complete registration, while the birth registration law may in return help to secure the thorough enforcement of notification. The purposes of such laws may be combined, as in the recent Massachusetts statute, which provides that physicians and midwives shall, within forty-eight hours after the birth of a child, mail a notice thereof to the local registrar (notification), and within fifteen days file a certificate of birth (registration), but that the notification shall not be required if the birth is registered within forty-eight hours.

In like manner the notification of sickness from occupational disease will be followed, in a certain proportion of cases, by the registration of death. The notification of all cases of occupational or industrial diseases ought to be a most valuable aid for the complete and satisfactory registration of all deaths from such diseases; and likewise the registration of the deaths should be a most important check on the completeness and promptness of the notification. It is, therefore, desirable that the notification and registration of occupational sickness and mortality should be thoroughly

correlated, and for this reason it will probably be found necessary to administer them under the same general direction.

The notification of occupational diseases may properly be considered a part of the general subject of the notification or registration of sickness in general. The reporting of sickness is a very difficult matter to deal with, and morbidity statistics are, as a rule, far less complete than statistics of mortality. Even with respect to some of the most important infectious diseases, such as typhoid fever, diphtheria, and tuberculosis, it will be found that in some localities many cases fail to be reported. This is readily shown by comparison of the reported cases of sickness with the deaths registered, according to which a most absurd ratio of fatality will not infrequently be shown. Such indications prove that physicians fail to a considerable extent to report the occurrence of notifiable diseases; and knowledge of this fact by the sanitary authorities should lead to rigorous enforcement of the law, with prosecution and the collection of fines when it is disregarded. It is likely that the same condition will be found to exist in the administration of laws requiring the notification of occupational diseases; and the whole experience of general registration points to the necessity of rigid and thorough enforcement of law from the very beginning, if fully dependable results are to be obtained and the true value of such legislation is to be demonstrated. It is far easier to enforce a reasonable law from the start than to restore the efficiency of a law that has become more or less of a dead letter.

The registration of sickness does not come in the scope of the Bureau of the Census, which receives and compiles the returns of deaths from the registration area of the United States. I shall, therefore, deal chiefly with the relation of the notification of occupational diseases to the registration of deaths from occupational diseases. It may be proper to point out, however, that the reported mortality from occupational diseases is as yet relatively insignificant, and the true measure of the loss of health and effective working power can only be learned from well-kept morbidity returns. For example, during the year 1910 there were, in the registration area of the United States, comprising an estimated population of 53,843,896, or 58.3 per cent of the total population of continental United States, and including practically all of the chief industrial states of the north and west, only one

hundred and thirty-six deaths reported from chronic lead poisoning and six deaths from other chronic occupational poisonings out of a total of 805,412 deaths from all causes. All the deaths from chronic lead poisoning were not occupational in character. The very small number of deaths (six) from other chronic occupational poisonings includes all deaths reported from phosphorus necrosis (whether specified as industrial or not), from chronic industrial arsenical and mercurial poisonings, etc. It is likely, however, that some deaths that should have been classified under this title were omitted because the certificates of death bore no evidence as to the industrial character of the poisonings, and some may have been reported under terms relating to mere symptoms or conditions, such as "paralysis," "necrosis," etc., that afforded no clue to the true nature of the cause of death. The returns were compiled in strict accordance with the international classification; and it is impracticable for the Bureau of the Census to investigate all doubtful statements of cause of death, although this is done to a certain limited extent. The responsibility for indefinite reports rests, primarily, upon the recording physician, and, secondarily, upon the local registrar of vital statistics who accepts a doubtful certificate and issues a burial permit thereon.

It may be noted in the above statement in regard to "occupational diseases" that the term is used in the very limited sense of occupational poisonings, and not in the broader sense of all diseases affected by occupations. Thus the draft of the "Certificate of Industrial Diseases" issued by the New York State Department of Labor provides for the reporting of "poison by lead, phosphorus, arsenic, or mercury or their compounds, or from anthrax, or from compressed-air illness." The schedules of California, Wisconsin, Connecticut, New Jersey, Maryland, and Michigan are the same as that of New York, while Illinois requires the reporting of "disease or illness due or incident to" a few specified dangerous occupations. The very recent introduction of such legislation is indicated by the fact that these eight states are the only ones having such laws. The report of the Illinois Commission on Occupational Diseases (January, 1911) related chiefly to industrial poisonings, although the scope of a more comprehensive investigation was fully pointed out. It may be asked, for example, whether the reporting of tuberculosis caused by, or aggravated by, occupation is contem-

plated as a regular procedure by means of any of the special notification blanks?

It is difficult to define those diseases that may or may not be affected, to some extent, by conditions incident to employment. The general study of occupational mortality is dependent upon comparison of the deaths from various causes of persons engaged in specified occupations with the corresponding populations or lives at risk, and it is hardly necessary to say that regard must be had to the age and sex distribution, as well as to the factors of race and color, in order to obtain comparable results. It is absolutely necessary that there should be a uniform classification of causes of death, that physicians should report the causes of death by means of precise and definite terms that can be readily compiled thereunder, and also that there should be an identical classification of occupations in use for both the population and mortality returns. In order to make the latter of the greatest service, physicians and others must be instructed in regard to the correct statement of occupations.

It is, therefore, very gratifying that a standard form of certificate of death has come into general use in the United States during the last ten years, prior to which time there was very little uniformity in this respect. This blank was originally prepared in 1902 and was revised in 1909 by the organized registration officials of the country (Section on Vital Statistics of the American Public Health Association). I desire to call attention especially to the form of statement of occupation on the present blank, with specification of the "(a) Trade, profession, or particular kind of work", and "(b) General nature of industry, business or establishment in which employed", and to the instructions on the back of the certificate relative to the statement of occupation and cause of death. Although not as detailed as the information sought on the New York certificate of industrial diseases, it was the general consensus of opinion among registration officials that the statement was as complete as it would be practicable to require in the general mortality returns. The necessity for full information in regard to the length of time employed, the previous employment, previous illnesses due to occupation, etc., can best be met by including such inquiries on the notification blank, thus avoiding incumbering the death certificate with many questions in addition to those already required for the general purposes of vital statistics. Thus the two blanks to a

large extent supplement each other, and may be used together as a basis for many important statistical purposes and intensive investigations. It would seriously interfere with the conduct of death registration, the extension of which to cover the entire United States is one of the most important tasks in which the Bureau of the Census is cooperating with state authorities and national associations, to add a single additional question to the schedules, which are already regarded as cumbrous by legislatures and those not familiar with the requirements of registration laws. But a state of high industrial development can readily obtain, by means of such blanks as are provided for notification of industrial diseases, all supplemental data required to make its occupational statistics of the greatest practical value.

A very beneficial means of building up complete and correct statistics of occupational mortality for the United States lies in the education of physicians, undertakers, and others in regard to the proper statement of occupation upon certificates of death, and in training physicians to report the causes of death under precise designations. For the latter purpose a booklet entitled the *Physicians' Pocket Reference to the International List of Causes of Death* has been distributed by the Bureau of the Census to all the physicians of the United States. It contains lists of indefinite and unsatisfactory terms, and also points out the importance of examining the statement of occupation (not usually filled in by the physician) so that full data may be available concerning the occupational influences affecting causes of death. Similar instructions are used by state and local authorities; and it is only necessary, with the growing knowledge of the importance of the statement of occupational diseases, to make such instructions just as precise as may be necessary. I believe that it might be useful for a committee of this Association to consider the subject and to cooperate with the registration officials and with the Bureau of the Census in obtaining more complete returns. Objections not infrequently arise when a local or state registrar questions the completeness of a return of death, that would be removed if a great national organization had pronounced clearly in regard to the necessity for full details.

In this connection I may say that the reporting of the causes of occupational mortality has suffered, in common with all reports of causes of death, from the entire absence in this country of an ac-

cepted nomenclature of diseases. I do not mean by this that we do not have a standard classification, or preferably statistical list, of causes of death and illness. The latter necessity was met by the general adoption of the International List in 1900, since revised at Paris in 1909. But this list is solely for statistical purposes and does not answer the purpose of a nomenclature, or authoritative guide for the selection of medical terms for the designation of diseases and conditions, such, for example, as the "Nomenclature of Diseases of the Royal College of Physicians of London", which has been the accepted authority in England for the past forty years. I am glad to say that the American Medical Association has undertaken to supply this deficiency, and that its Committee on the Nomenclature and Classification of Diseases has held several sessions during the present meeting of that association and will submit a report calling for the publication of a nomenclature for immediate practical use. In this nomenclature, which must necessarily be regarded as somewhat provisional or tentative in character—although the committee has labored upon the subject for several years—precise directions will be given for the reporting of industrial poisonings, and the importance of such reports will be emphasized as earnestly as possible. It is hoped that any suggestions on the subject from members of this Association, and also any action which may be taken by the Association on the basis of the papers presented by Dr. Thompson and others, may be promptly sent in to the committee, a statement and report by which may be found in recent issues of the *Journal of the American Medical Association*.

The nomenclature will be arranged in the order of the International List, in accordance with the original resolution of the House of Delegates adopted in 1907. This is for the purpose of comparability with the statistical lists employed for the compilation of morbidity and mortality statistics. For the essential use of the nomenclature the question of classification is of minor importance. One arrangement may be as good as another for the presentation of industrial diseases, but as a matter of convenience it is desirable that tables should present causes of death as far as possible in the international order. Of course, the titles of the International List can be subdivided to any extent found necessary, but when this is done the aggregates should be comparable with the causes shown under

the corresponding titles in general morbidity and mortality statistics. The Bureau of the Census and the Registrar-General of England have recently published manuals for the assignment of terms to the International List, so that a convenient guide will be available for all offices compiling statistics of occupational causes of death. Thus the general comparability of all classes of mortality and morbidity statistics will be assured.

MEDICAL INSPECTION OF FACTORIES IN ILLINOIS

HAROLD K. GIBSON

Medical Inspector of Factories in Illinois.

Is the Occupational Disease Act of Illinois in its application practical? To this question, although appreciating the fact that our experience is all too brief, I must answer most emphatically in the affirmative. There have been reported, in the period from August 1, 1911, to April 1, 1912, two hundred and forty-seven cases of occupational or industrial disease, which were divided as follows:

Lead	240
Arsenic	6
Phosphorus necrosis	1
<hr/>	
Total	247

When it is taken into consideration that in this period not to exceed thirty-one manufacturing establishments were reporting, the importance of this legislation, particularly as it concerns the reporting of occupational disease, may be grasped.

Personal experience has taught me that the Occupational Disease Act, as applied in our state, must fall far short of its mission unless we keep continually before us the idea of education, not only of employee, but of employer. I have with me now, indeed, the mental picture of two large manufacturers of paints whom we will designate as X and Z. Both plants are new and well equipped with modern devices for collecting dust; both have shower-baths, abundant facilities for washing, dining rooms, compartment lockers, working clothes, and regular medical examinations by well-qualified physicians. X reported eight cases of industrial lead poisoning for the month of October. Z reported seven. From this period until April 1, the monthly reports of X have failed to show a single case of lead poisoning; while Z, on the contrary, has reported on an average of four cases monthly since October. Why this great discrepancy in two large industrial concerns using a practically identi-

cal process, having the same number of employees, both of modern building construction and sanitation, and both complying with our occupational disease law? Because X is complying with the spirit as well as the letter of the law, while Z is complying only with the letter. Being present in X's plant recently when the noon whistle blew for lunch, I was surprised to find that X not only allowed sufficient time for thorough scrubbing of the hands and face, but that the firm provided a man whose duty it was to see that all hands were clean before the food was taken from the locker.

It is merely a difference in superintendents, foremen, and shop discipline. An employee in the plant of X knows that the creation of an unnecessary amount of dust, as, for example, in opening a container of white lead, or the failure to wear his respirator where there is dry grinding, means a reprimand from the foreman or, if he is a chronic offender, dismissal. On the other hand, the superintendent at Z plant is a lead man of thirty years' experience, who boasts he has never been leaded, and who believes that chewing tobacco is the greatest of all prophylactic measures in the prevention of lead poisoning. It was interesting to note, however, that this man, although not a user of alcohol, had a blood pressure of one hundred and sixty and peripheral blood-vessels of the consistency of whipcords. Z will not get results in his plant, with all of his modern sanitary apparatus, fans, and dust collectors, until he gets foremen who will personally supervise the hygiene of his men. I grant you that this is not a simple matter.

Quite recently, in the inspection of the linotyping room of one of our largest dailies, equipped with a splendid exhaust system, the men complained bitterly that the exhaust and fans caused colds and sore throats. These are purely matters of education. Then there is the employer who tells you that the men prefer the saloon to the dining room and will not use a shower-bath, and that the men will not wear respirators; he is as badly in need of education as his employees. Demonstrate to him what an intelligent foreman can accomplish.

Will you allow me to tell you of our experience with the Pullman Car Company which, by the way, was the first corporation to comply with the occupational disease law in Illinois? Their first report made after our preliminary inspection showed seventy-three cases of lead poisoning. Bear in mind that they employ between three

hundred and six hundred painters and interior finishers, and that these people are engaged in an occupation, peculiar to the finishing of Pullman cars, which is, I believe from personal experience, the most fraught with danger of any of the occupations in which lead is handled. I refer to the dry sander of lead inside the Pullman car. Here a group of men is confined in a relatively small place devoid of artificial ventilation, rubbing down dry lead paint with emery paper. They told us in the beginning that men could not be made to wear respirators in such a case; that they would want to temporize with a strip of gauze or a handkerchief tied over nose and mouth. I wish to emphasize the point that in this, the most dangerous of the lead trades, the gauze or handkerchief will not do. Only an approved respirator, constantly worn when at work, and the most scrupulous personal hygiene, will save the dry sander of lead. His work admits of no compromise.

To recapitulate, the Pullman company had seventy-three cases in August; they have not had a case for the past four months. They have a perfect equipment of baths, washing facilities, lockers, clothes, and dining rooms; but more than that they have a safety department with a man at its head who is an enthusiast in his work and who believes that lead poisoning in employees can be practically eliminated by personal supervision. Remember, too, that these men, of all classes of lead workers, are doing the character of work which furnishes the greatest number of cases of lead poisoning. That is to say, they are painters and sanders.

Permit me, also, to say a few words upon the importance of what our German colleagues call the *symptom complex* in making a diagnosis of industrial disease. I will refer to lead, as it is easily the most frequent and has the most disastrous final results of any of our industrial poisons. The blue line is by no means pathognomonic of lead poison, nor is a basophilic degeneration unless a previous malaria can be excluded, and it must be borne in mind that many of our lead workers, at least in Illinois, come from the malarial belt of southern Europe. Muscular weakness in any group of muscles with anemia I regard as most suggestive, even without colic or blue line. You must not ask a man if he has abdominal pain, but if he has pain and where, giving importance to the group of symptoms rather than to any one symptom, unless, of course, it be a wrist-drop or a typical colic. I have found what I considered a well-marked case of

lead poisoning where there was no history of pain, muscular weakness or paralysis, and no blue line, but a moderate anemia, albuminuria, and a blood pressure of one hundred and eighty, with a basophilic degeneration. Of course, in estimating the value of blood pressure, one must exclude alcoholism and evidence of venereal disease. Just a word in regard to the importance of basophilic degeneration as a sign of lead poisoning. In a series of twenty-six cases, all of which presented a certain degree of anemia, I found this sign present in twenty-one cases.

If I have dwelt upon lead to the seeming exclusion of other poisons, it is because of its commercial importance. I am sure that we in Illinois owe a debt of everlasting gratitude to this Association and to your honorable secretary, in particular, for his efforts in the matter of white phosphorus legislation. The Esch-Hughes Act will eliminate one plague spot from our industrial disease map in Illinois, and one which was particularly offensive, as 70 per cent of the employees exposed to the fumes of phosphorus were girls under the age of twenty. But consider, I beg of you, that while phosphorus necrosis is a loathsome disease, yet it is strictly a local disease, and where it numbers its victims in tens, lead numbers its victims in thousands. I wonder how many lead workers of all grades could obtain a standard life insurance policy at the age of thirty-five. Remember, too, that the atheromatous changes produced in the vessel walls by lead, as also the kidney changes, are permanent.

COMPRESSED-AIR ILLNESS IN CAISSON WORK

L. M. RYAN

Medical Examiner, New York Foundation Company.

Under conditions as they exist in New York at present employment in compressed air is not such a dangerous occupation as it was a few years ago. As improvements have been made in equipment for lessening the laborious part of the work and for overcoming the difficult problems of engineering, so has there been a great advance toward bettering the conditions under which the men are working. Chief among the altered conditions which have lessened the dangers of loss of life from caisson disease are: (1) physical examination of all employees; (2) shortening the hours of labor; (3) hospital locks, in charge of qualified attendants, where victims of the "bends" can be immediately recompressed; (4) lengthening the time of decompression in coming from work; (5) substitution of electricity for candlelight; and (6) a greater tendency on the part of the men to sobriety.

I am speaking now with reference to the work of sinking caissons for foundations of buildings, and particularly of the compressed-air work during the last five years in connection with many of the large buildings in lower Manhattan. Caissons or large vertical boxes are sunk to rock or hardpan, as necessity may demand. As the earth is excavated from underneath and inside the boxes the caisson settles, so that when rock or hardpan is reached we have a hollow vertical cylinder, or a miniature tunnel, leading from the surface of the ground to a solid support. For a building which extends over a large area a great many of these caissons have to be sunk. In the case of the municipal building of New York, for example, one hundred and six caissons were sunk to a depth of one hundred and twelve feet below water level and one hundred and thirty-five feet below the street level. These boxes or caissons are sunk in groups of three, four, five, or six, so that a force of from one hundred to one hundred and fifty men, or even as many as five hundred men, are employed at one time. The air is pumped from air compressors to the caissons and the pressure varies ac-

cording to the depth of sinking, so that at the same moment we may have one caisson, which is nearing its destination, having a pressure of as much as forty-five or forty-six pounds and another one, just being begun, having a pressure of only two or three pounds.

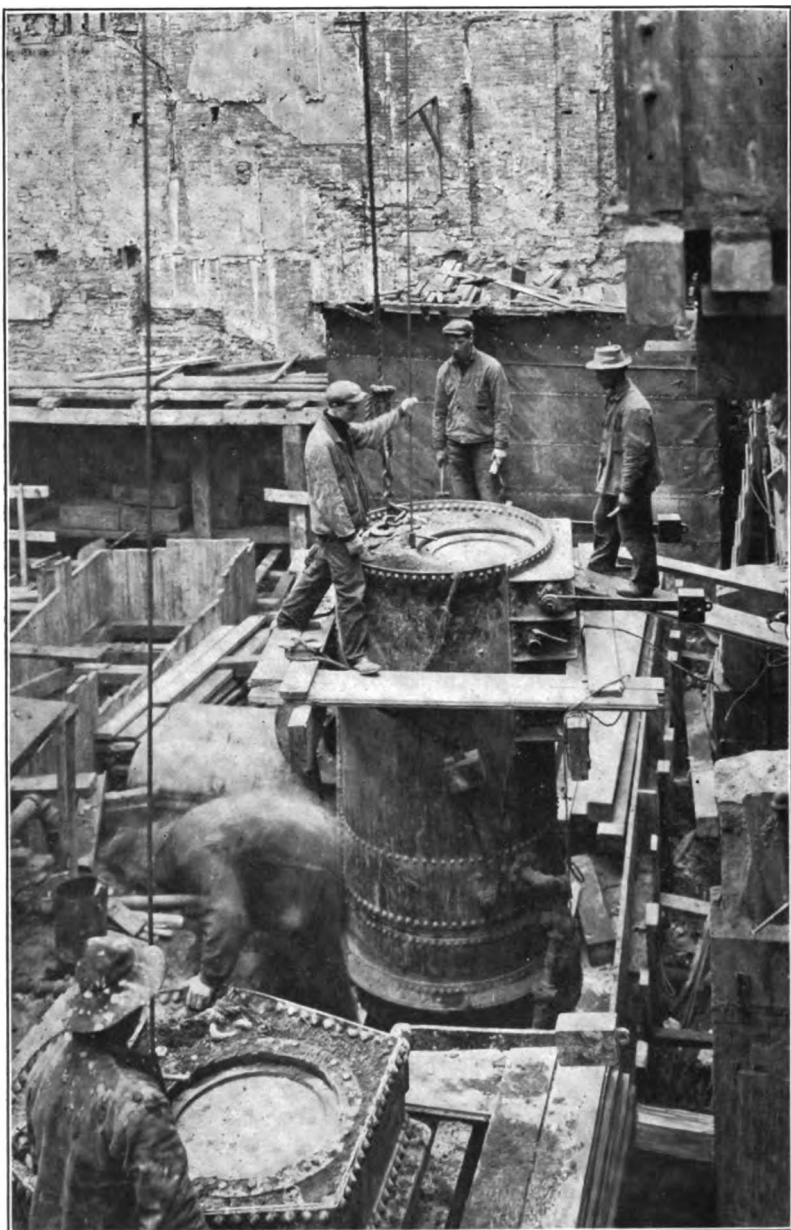
In caisson work we have a few difficulties to be dealt with that are not met in tunnel work, but in the main the problem is the same. The percentage of cases of compressed-air disease in my experience has been lower on foundation work than in tunnel work, in spite of the fact that under most circumstances employees in caissons are working under more disadvantageous conditions than tunnel workers. The reason for this is, I think, that in tunnel work, up to the present time, for the same pressure the men have worked longer hours. In caisson work our main difficulty in the past has been in lengthening the time of decompression on exit from work. One reason for this is that, on account of the comparatively small size of the lock used in this work and through which all employees must pass, it is a much greater mechanical problem to diminish the pressure gradually. I mean that, comparing two locks, one large and the other small, with an equal pressure of air on them, if you release the same amount of air from each through the same sized valve, the pressure in the small lock will drop much more quickly than in the large one. Another reason is that the lock used on the caisson, in contrast with tunnel work, is not permanently placed, as it must be lowered with the caisson. The necessity for the frequent removal of locks leaves a greater margin of chances for leaks to occur from time to time, and from a leaky lock it is almost impossible to release the air slowly. In addition, the cramped position that the air worker must assume while sitting in the bucket during decompression differs from the comparative comfort with which he issues from a tunnel lock. Another feature of caisson work that has to be reckoned with is the environment of a busy city, as compared with the location of a tunnel plant which is usually in a more secluded section. In the former case the force of men, like the pressure of the air, is constantly changing; in the latter the tendency is more for the force to be a steady one, for the men have a pressure to work in that is pretty nearly constant and is not accompanied with the same degree of uncertainty.

In considering the problem of how to care for the men, the

two factors that are of the utmost importance are: (1) the rejection for work of all physically unfit; and (2) slow decompression in coming from work. The only death that has occurred in any of the work of which I have had charge during the last five years was due to a pressure of only twelve pounds of air where a man had gone to work without having been examined. Post-mortem examination showed that he had had a dilated heart which ruptured from the strain of a fairly rapid decompression. Very few cases of caisson disease occur in a pressure less than twenty pounds. In the examination of the men it should be borne in mind that it is an extraordinary occupation in an extraordinary atmosphere, and only extraordinary men should be employed. They should be physically above the average, between the ages of twenty-one and forty, of slender build, non-alcoholic, and with absolutely sound heart and lungs. Any variation from normal, even in rate or regularity of the heart, should be enough to reject a man. No man with symptoms of any organic disease should be passed.

The fight for slower decompression has not been with the contractors so much as with the employees themselves, and I do not believe that the reason is so much the desire on the part of the men to get away from their work quickly as it is a spirit of bravado that prevails with nearly all. There is a certain contempt developed for the air, the result of familiarity. As they say, they can "eat air". Reason and a few painful lessons, however, have diminished this spirit to a great extent and, by the placing of responsible men in the position of lock-tender, we have been able to regulate the time to much better advantage. Nearly all cases are caused by too rapid decompression, and my experience has been that where the decompression has been slow no serious case has ever resulted. It is my belief that if a sufficiently long time were taken for decompression we would never have a fatal case in an otherwise healthy man.

The time that should be taken for proper and scientific decompression depends directly on the amount of air that is dissolved by the blood under pressure. And the amount of air dissolved by the blood is determined by (1) the length of time spent in the air, (2) the number of pounds of pressure, and (3) the amount of exercise undertaken in the air. A lock-tender may go rapidly in and out of very high pressure with no ill effects,



AIR-LOCK ON TOP OF CAISSON
IN SINKING FOUNDATIONS FOR SKYSCRAPING BUILDINGS MEN GO DOWN
BENEATH THE WATER LEVEL AND WORK IN COMPRESSED-
AIR CHAMBERS OR CAISSONS

THE AIR PRESSURE IS FREQUENTLY MORE THAN THREE TIMES THE NORMAL
FIFTEEN POUNDS PER SQUARE INCH. WORKERS, IF RELEASED GRAD-
UALLY DURING DECOMPRESSION IN THE AIR LOCK, AVOID THE
"BENDS", OR COMPRESSED-AIR ILLNESS

as his stay in the air is short. Superintendents and engineers, whose stay is shorter than that of a regular shift and who do no manual labor in the air, do not suffer from the "bends" as frequently as do the diggers.

In addition to the purely mechanical problem as a causative factor, we have to take into account the individual susceptibility to caisson disease. Five men of apparently the same physical condition come out of a caisson under absolutely the same conditions. One of the five is attacked by the affliction and the other four are unaffected. What determines this susceptibility? The blood of each undoubtedly dissolves the same amount of air under pressure, and when the pressure is reduced the air comes out of solution in precisely the same length of time. Authorities differ as to the change in pressure in the vessels, but to my mind this is a real and important factor. If the pressure within the vessels were not increased, the blood could not dissolve the air or hold it in solution. Consequently, in rapid decompression we have not only to deal with air in the form of small emboli in the blood stream, but we have exerted against the vessel walls an abnormal pressure which has not had time to diminish at the same rate as the air in the air-lock. The vessel walls of the man in good condition, or rather the man who is the good risk, are able to counteract this pressure and carry the air to the lungs where it is expelled. The man whose vessel walls dilate under this pressure is not able to get rid of his air so quickly, and the small emboli collect in sacculations at the weaker points and remain until recompression is carried out so that the air is again taken up in solution in the blood.

For my own convenience I have classified the different types of the disease as follows: (1) spinal type; (2) cerebral type; and (3) pulmonary type. Each of these is again subdivided into (A) mild variety, and (B) severe variety. Of the spinal type the mild variety is characterized by aching pains in the extremities; and the severe variety by paraplegia and general weakness but no pain. Of the cerebral type the mild variety is characterized by vertigo, nausea and some prostration; and the severe variety by coma, usually hemiplegia, and great prostration, with pulse and respiration barely perceptible. The main symptom of the pulmonary type, which is seen less frequently, is dyspnoea. The mild variety of the spinal type never results fatally, but in rare cases it causes a wasting of the

muscles of the thigh by a gradual process which involves the hip-joint as well. The severe variety, with paralysis of the legs, never terminates fatally except from the secondary results of a myelitis, where treatment has been of no avail. The milder variety of the cerebral type is due probably to a disturbance of the internal ear and terminates favorably; but the severe variety of the cerebral type, characterized by coma, is fatal in many cases in spite of any treatment that may be instituted.

In regard to the treatment of the severe cases, everything depends on proper and skilful recompression in the hospital lock. The greatest mistake in the past has been in recompression to the number of pounds in which the patient was working. This is absolutely unnecessary and is highly dangerous. Uniformly good results are obtained by recompressing to two-thirds what the pressure was in the working chamber. This corresponds in some measure to Dr. Haldane's theory of rapid decompression for the first stage. When the desired pressure is attained it is wise to leave it stationary for some time, according to the merits of the case and the improvement of the patient. In all cases of the severe type the medical attendant should be recompressed with the patient and it is his duty to use artificial respiration if necessary, to massage over the heart with movements of the extremities, and in many cases to force the mouth open and promote respiration. When consciousness returns it is wise to encourage the patient to execute voluntary movements and to get up and walk in the lock, allowing him to rest at intervals. Decompression in patients afflicted with the milder variety of the disease can be carried out at the rate of about one pound in four minutes, taking one hour where the recompression has been to 15 lbs. In the severe cases, decompression should be much slower, at the rate of ten to twelve minutes for a single pound,—that is, where the recompression has been to 15 lbs. taking as long as two and one-half or three hours, and where the recompression has been to 20 lbs. taking as long as three and one-half or four hours.

The following is the history of an interesting case followed by recovery:

Name, J—— M——. Age 28. Ht. 5 ft. 6 in. Wt. 160 lbs.

History:—On December 10th, 1909, started to work in 37 lbs. pressure without ever having been examined. He had been quite ill for about two

weeks previously, suffering from a severe cold. Worked for two hours, although he had never been employed in compressed air before. On coming out of the lock was decompressed very rapidly, in about one minute's time, with the rest of the gang. He fell unconscious and was carried to the lock for recompression.

Treatment:—Was at once recompressed with an attendant to 20 lbs., and after the air had been maintained at this level for about ten minutes recovered consciousness and was able to get up and walk about in the lock. He was gradually decompressed, taking a period of two hours. On exit from the lock he felt pretty well, but at the end of fifteen minutes again fell over unconscious and seemed to be quite lifeless. He was again recompressed with myself to 20 lbs. and under the same treatment recovered consciousness in the air. His pulse was weak and rapid, pupils dilated, and body covered with a profuse perspiration. I encouraged him to sit up, after administering strychnine to him hypodermically. Passive movements were carried out with massage and two and one-half hours were taken for decompression. When he made his exit from the lock he felt fairly well, but was noticeably weaker than he was on coming out the first time. He was allowed to rest in the recovery room and restoratives were administered to him. Five hours later he said he felt well enough to get up and walk around, but complained of some dizziness. He was standing up near the hospital lock and was speaking to me when he was seized with a violent convulsion and fell over in my arms. He was again recompressed with me to a pressure of 22 lbs. and the pressure was maintained at that level for an hour before he fully regained consciousness. During that time I was using artificial respiration on him, his jaws held open with a mouth gag and his tongue drawn forward. It was almost a quarter of an hour before he breathed at all satisfactorily. At the end of an hour he could answer questions but only in an indefinite way, and he had a well-marked paresis of his left side. This gradually improved, but he was so very weak that he was inclined to lie down. He wanted to sleep continually. We released him very slowly until at the end of five hours decompression was complete. This was at the rate of one pound in fourteen minutes. He was carried to the recovery room and by that time had recovered entirely from the coma and paresis. He was given some broth and was allowed to sleep for three hours. He rested for two hours more and at the end of that time was so improved that I allowed him to go home.

He never had any recurrence and was able to come around for his pay three days later. Two weeks later he was in apparently good health, but I advised him never to enter even the slightest pressure again. Nevertheless, within three weeks of his illness, he did go to work in light pressure in another part of the city, but only worked a few days. About four months later he had an attack of pneumonia and died.

LEGAL PROTECTION FOR WORKERS IN UNHEALTHFUL TRADES

JOHN B. ANDREWS

Secretary, American Association for Labor Legislation.

The need of labor legislation for the protection of workers in unhealthful trades is so apparent to anyone at all familiar with the facts that argument upon the subject is unnecessary. "Factory legislation", to use the earlier English term, has aimed particularly at the protection of workers from insanitary conditions of employment. Long before any considerable number of people admitted that legal regulation of working hours and of wages was justifiable, there was very general recognition of the fact that the worker was entitled to a decently safe place in which to labor. The reasonableness of sanitary regulations as a legitimate interference with work conditions prescribed by the employer and suffered by the employee, has also been more uniformly upheld by the courts than any other kind of labor legislation.

In general, certain trades are unhealthful and require regulation principally because the workrooms under ordinary conditions are likely to be poorly ventilated. More specifically, the harmful conditions of employment are frequently due to the presence of dusts, gases, vapors, and fumes; to extremes of temperature, humidity, or density of the atmosphere; and to improper lighting and overstrain.

The evil results of unhealthful conditions have long been recognized, and in every industry there are humane and intelligent employers who devote much time and money to the elimination of unnecessary hazards. Whether prompted by humanitarian or commercial considerations, these advanced employers frequently provide model establishments. By their commendable efforts they also help to establish reasonable standards of comfort and safety which, when drafted into labor law, constitute uniform minimum requirements for all employers in the same industry. But only through the uniformity of regulation which legal enactments alone can secure, can these more progressive and humane employers be themselves pro-

tected from less scrupulous competitors who would otherwise often fail to go to the expense of providing adequate safeguards, and only through such compulsory uniformity can the health of the employees of these competitors be protected.

It frequently happens, moreover, that even a vast majority of the manufacturers in a given industry claim that they are unable to bring about reforms, which they freely admit are desirable, without the aid of uniform legal regulations to force the recalcitrant minority into line. A striking example of this, the condition which culminated successfully in the poisonous phosphorus match prohibition act, is still fresh in the public mind. Match manufacturers, representing ninety-five per cent of the total product, testified before Congress that they could not substitute a harmless compound for the slightly cheaper poison without a uniform law compelling all manufacturers in that industry simultaneously to abandon the poison. Match manufacturers representing the remaining five per cent of the product stood out stoutly until the last, declaring that they would close their factories before they would submit to this sanitary regulation already in compulsory operation in practically all the civilized countries of the world. It required labor legislation to prohibit the use of this unnecessary deadly poison before "phossy jaw", the most loathsome of all industrial diseases, could be abolished.

For other industrial poisons there are harmless but more expensive substitutes. Automatic mechanical processes can be substituted for dangerous methods still conducted by hand labor. Scores of operations in the present list of particularly insanitary trades can be made safe by the use of scientific apparatus for the removal of dangerous dusts and fumes.

The unhealthful trades demanding legal regulation may be conveniently classified according to the nature of the principal hazards:

- (1) Trades menaced by specific industrial dusts, fumes, gases, vapors and acids (poisonous and non-poisonous);
- (2) Trades menaced by compressed or rarified atmospheres;
- (3) Trades menaced by improper light;
- (4) Trades menaced by extremes of temperature and humidity;
- (5) Trades menaced by excessive strain.

Hundreds of peculiar injuries, caused by these unhealthful conditions of employment, are now beginning to receive serious atten-

tion in America as special diseases of occupation. This new line of study is most encouraging to those interested in securing effective legal regulation of unhealthful trades, because it has long been recognized by the people most familiar with the facts that specific studies, leading to the establishment of more definite standards of safety, are necessary before much even of the now existing legislation can be effectively enforced.

While such researches are under way, we should emphasize at every opportunity the following considerations: (1) All preventable occupational diseases must be prevented; (2) those occupational diseases which we do not yet know how to prevent must be reduced to a minimum; and (3) the victims of occupational disease must be compensated for their injuries by some just system of insurance.

Efforts to carry out this program lead naturally to three principal methods:

- (1) *Absolute prohibition.*—Through the successful outcome of the efforts to secure a prohibitory tax upon matches made with poisonous phosphorus, an avenue of tremendous possibilities, if carefully followed and not abused, is opened up for the further conservation of human life.
- (2) *Regulation.*—There may be specific or general regulations:
 - A.—*Specific regulation.*—For the sake of clearness we may recall, as an illustration of specific regulation, the earlier history of the match industry, when several countries, before harmless substitutes for poisonous phosphorus were discovered, attempted to prevent “phossy jaw” by requiring, (a) that match paste should contain not more than seven per cent of the deadly poison; (b) that no one should be permitted to work in the poisoned atmosphere of a match factory more than eight hours in any one day, and (c) that children should not be so exposed. There were, then, in this intermediary period of specific regulation, three definite limitations, (1) upon the hazardous material, (2) upon the period of exposure, and (3) upon the persons exposed. By this method of specific regulation also there are extensive possibilities for legal regulation in the interest of human health.
 - B.—*General regulation.*—This method is, unfortunately, the most common. If, again, for the sake of clearness, we make final use of the match-factory illustration, we recall that be-

fore prohibition was thought of and before specific regulation had been tested, most countries had made vague efforts, through general regulations, to provide education, ventilation, and cleanliness for the promotion of the comfort and health of workers in match factories. This general method lends itself most readily to that large group of trades in which the occupational causes of industrial maladies are least clearly defined. It marks the earliest stage of regulation where, on account of complex conditions of employment, we are still feeling our way in partial darkness without definite standards for our guidance.

- (3) *Insurance*.—It is now recognized that the campaign for workmen's compensation or insurance for industrial accidents, both in Europe and in America, has been the greatest practical force in the prevention of such injuries. No intelligent person can go far in the study of insurance against industrial accidents without realizing that a logical consideration of the facts must lead likewise to insurance against industrial diseases. A workman, incapacitated by disease contracted in his trade and due to his employment, is as much entitled to compensation as if he had been disabled by an accident. In many European countries this principle is already established.

In all attempts to control dangerous trades, the method of general regulation has naturally preceded specific regulation and absolute prohibition as well as insurance. On paper it is by far the easiest, and unfortunately it creates a temporary impression of accomplishment which is quite fascinating to the occasional-day reformer. It is probably a necessary first step in most industries where definite, enforceable, scientific standards must wait upon investigation and practical experiment.

In attempting to deal intelligently with these problems, our bill drafters are hopelessly baffled by the lack of scientific standards. And nothing is more clear to serious students of the subject than the unavoidable conclusion that effective laws for the regulation of unhealthful trades cannot be properly drafted by busy and harassed legislators in the midst of legislative sessions. In the field of industrial hygiene, no greater contribution could be made at the present time than the establishment, by a commission of experts, of such standards.

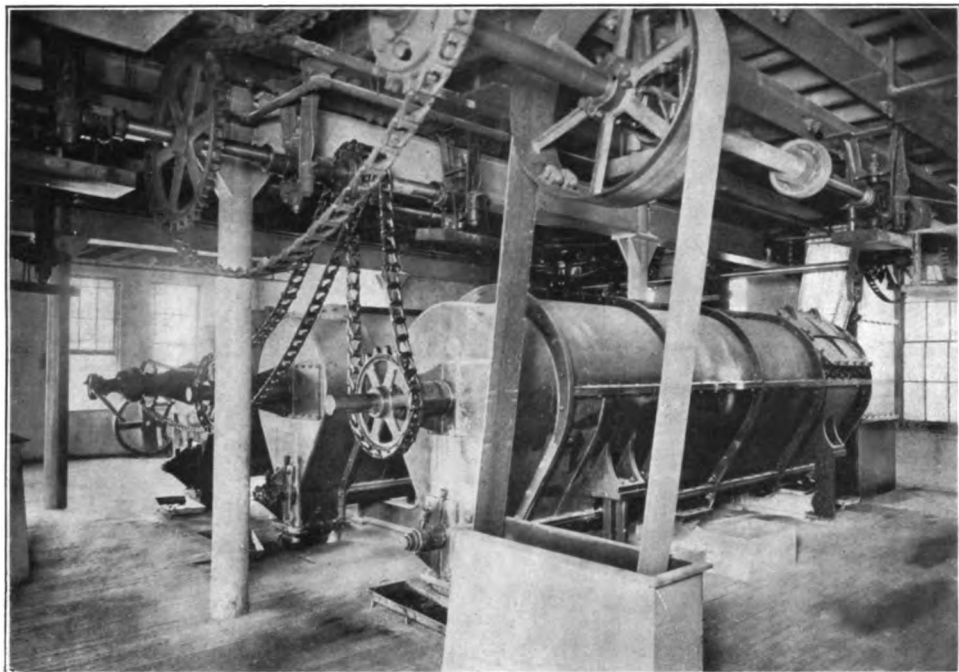
The existing laws in this country for the regulation of factory labor in the interest of the comfort and health of the workers are for the most part formulated on general lines,—confused, indefinite, and full of loopholes. In the fifteen states which even pretend to protect workers from the effects of poisonous gases, fumes, and vapors, the laws seldom give more definite directions than that such dangerous gases, fumes, and vapors must be removed or rendered harmless “when injurious to the health of employees”, or “so far as practicable”, or “if necessary”. In one state the law sweepingly provides for all health protection by stating that the factory inspector “shall also examine into the sanitary conditions of factories, workshops, mines and quarries, and when any condition or thing is found that in his opinion endangers the health or lives of the employees, he shall notify and direct the employer to rectify the same.” This class of statute law, which is quite common, places no duty upon the employer to provide proper protection until he is ordered to do so by the inspector. When one considers the area to be covered in our large industrial states, and the number of workplaces to be inspected, it can easily be seen that workers depending for their safety upon the specific orders of a limited number of inspectors are likely to receive entirely insufficient protection from laws of this character.

Although work in compressed air has become an important element in the building trades of this country, New York is still the only state which has a scientific law relating to work of this character.

There are only twelve states that make any mention of the subject of light in their general factory or labor laws. And “in not one of these”, says a well-known efficiency engineer, “are the provisions sufficiently specific to render them of practical value.”

Laws intended to protect the workers from injurious dusts in factories have been enacted in twenty states, but they are generally very crude and in practice more or less ineffective. “Drastic legal requirements alone”, says the leading American authority on this subject, “are certain to bring about the required degree of comfort and health.”

One reason that many safe methods are not in operation at the present time is simply that many employers, busy with the making of profits, have had no sufficient incentive to turn their attention to factory sanitation; and another reason is that state factory inspect-



"SEPARATING SCREENS" IN WHITE-LEAD FACTORY
A ONCE DUSTY PROCESS IS HERE MADE PRACTICALLY FREE FROM LEAD DUST
BY THE USE OF ENCLOSED CHURN-LIKE MACHINES WHICH SIFT
THE METAL FROM THE CORRODED WHITE LEAD

ors have not always been fully aware of their opportunities and responsibilities. The motive which leads some intelligent employers properly to equip their plants with safeguards is undoubtedly the conviction that it increases the efficiency of their workmen. There is abundant testimony to that effect from the rapidly rising profession of efficiency engineers and from their patrons. But even the most enthusiastic "boosters for safety" among the thoughtful efficiency experts recognize the absolute necessity for the establishment of uniform legal standards of safety if the health of the great majority of factory workers is to be conserved.

Recently a few of the less thoughtful enthusiasts in the popular agitation for efficiency have failed to get the true perspective and have clamored for protection for the workers solely upon the ground that "*it pays*" the employer. Let us congratulate ourselves that those who are in danger of losing their health and their lives in their daily toil have in some instances at least that incidental advantage. But let us have less of this everlasting dinning in our ears that, before we ask for decent protection for the workers, we must first demonstrate that each advance toward health and safety will actually put *additional dollars* in the pockets of employers. Let no one forget, meanwhile, that the philosophy of mercenary profit, when carried to its logical conclusion, may result in some instances, where it is not clear that profits will respond immediately to the expense of safety, in less than decent protection. No man in this Republic should be permitted for a moment to forget that, no matter how urgent is the duty to protect the property of citizens, society has a much higher responsibility, the protection of *human life*.

In our efforts to secure the necessary information upon which to base intelligent legislation, we must draw more and more upon the expert service of the physician. Eight states have already enacted laws requiring medical reports on the most easily recognizable diseases of occupation. These reports will indicate special danger points for intensive study within industrial establishments. Periodical physical examination of workers in particularly hazardous trades is now required in one state, and the regular medical inspection of factories, now unhappily limited to three states, will undoubtedly be extended rapidly within the near future. Medical colleges might well include regular courses on industrial hygiene; hospitals, too, will be expected to improve their system of records;

and in the leading industrial centers we shall eventually have special clinics and wards for the study and prevention of industrial diseases. Recent developments indicate that the medical profession will not evade its opportunity and responsibility.

For many years it has been our shame that in this field we have lagged far behind some of the countries of Europe. Our scandalous disregard for the safety and health of workers is widely known. But in this country true reform waits not so much upon sentiment as upon facts. We are just beginning to utilize the materials at hand, and our machinery for scientific cooperation in promoting industrial hygiene is but fairly set in motion. We move rapidly when once under way. Let us press on in the hope that another generation may see America *leading* the nations of the world.

GENERAL DISCUSSION

DR. C. T. GRAHAM-ROGERS, *Medical Inspector of Factories, New York*: Any discussion of the question of state promotion of industrial hygiene would comprise four points, first the reporting of industrial diseases, second the recording of the reports, third intensive study of the means of prevention, and fourth education. The departments of state which would naturally be responsible would be the health department, the labor department, and the educational department.

Dr. Wilbur has spoken of how the question of reporting corresponds to the registration of births. The notification of industrial diseases gives us some idea of how to make an investigation and then of how to prevent further trouble. The morbidity returns are more important than the mortality returns. Last year I went over the reports of New York State and I noticed that the mortality from pulmonary tuberculosis in a locality known for steel grinding appeared to be low, while in an essentially country district it appeared to be very high. I have visited every factory in the state and, from the known facts that I have of the steel district, these statistics are no indication whatever of the real conditions. In foreign countries the records are more complete.

In New York State the reports of occupational diseases are sent to the bureau of labor statistics. Dr. Hatch of that bureau then sends me a copy of every report that is made. These cases are followed up and when they run up to a certain number in an industry we start an intensive investigation. We try to find the cause of the occupational disease, whether it is due to dust, to fumes, to gases, or to atmospheric conditions. We try to find the exact point in the industry that is to blame. We have in New York an engineering inspector who takes up the matter with the medical inspector whenever it is a question of mechanical means for the removal of dust, fumes, and gases.

The state labor department can also take up the question of the home worker and of the child worker. In the promotion of industrial hygiene it is an important thing to know whether or not a child is fit to go into an industry. If a child is not fit to go into

a certain industry we should keep him out. The educational department can help in this work by vocational schools, by finding out what the children are fit for, and by teaching them that there are certain means to protect their health and lives and how to use these means.

Dr. Overlock, in taking up the question of education, has emphasized the instruction of physicians in medical colleges to understand and know industrial diseases when they see them. I think that is most important. I myself had an example of the need for such instruction. I went into a factory where they made storage batteries and one of the workers there had a typical case of lead poisoning and wrist-drop. I asked the foreman if he had known anything of lead poisoning. He said no, that the individual just hung around there, suffering from rheumatism and one thing and another, and that it was a matter of charity to let him do little jobs. I asked the worker if he had been to a physician and found that he was being treated for rheumatism. He was in the vicinity of the Vanderbilt Clinic, so I gave him a card and sent him over there. It was a well-marked case of lead poisoning and not rheumatism. So the statement made by Dr. Overlock is true. Some of the medical men are not instructed and do not see enough cases to be able to recognize these diseases.

MR. PAUL KENNADAY, *Secretary, New York Association for Labor Legislation, New York City*: I liked particularly Dr. Overlock's suggestion with regard to tuberculosis. A tuberculosis campaign furnishes us with a standard for the whole question of industrial disease. What the people who are fighting tuberculosis have done it seems to me we should do with industrial diseases in general. The exhibition, the lecture, the printed leaflet, and the newspaper have all been used with great success in that campaign, and we should use the same means in the matter of industrial diseases.

We must get this thing over to the public. We must make them realize that there is a relation between occupation and disease, and we must not be overnice in the way we go about it. In Massachusetts they say that at one time there was a sign in Boston which stated that the public was requested not to deposit sputum upon the pavements. We said in New York, a more vulgar lot, "Don't spit", and I think the message carried over rather better,

It is the same with regard to industrial diseases. We are dealing with people many of whom are not very intelligent, who are rushed with their occupations, and who have no time for study, and we must make this message to them just as brief and just as vivid as possible. We must use the picture to a large extent and we must use the exhibition. We ought to have in every large city in this country a permanent industrial exhibition open day and night, especially on Sundays and holidays, for the education of the worker as well as the manufacturer. Then we should make use, it seems to me, of the motion picture. There are infinite possibilities there for driving home this lesson of prevention.

We must remember, too, that we must educate not only the industrial worker but the physician. If we are to believe the physicians themselves, this latter job is probably more difficult than the former. The physician looks rather askance on anything new and he is fearful of reformers. We must gain his confidence and we must not be over strenuous in our desire to force this registration law. In New York City the law compelling registration of tuberculosis was first put on the books, then physicians were notified of it, then lectures were given; and the thing was worked up gradually among the people until it came finally to actual enforcement. By that time the law had the good-will of the majority of the medical profession.

The same method should be applied to the reporting of occupational diseases in general. But, finally, the whole thing is up to the state labor departments and not to reformers or welfare workers or employees. Our public officials are put there to do the job for us. They are our representatives, the representatives of the great body of the public, of the trade unionists and also of the men who are not organized but who are still part of the people. It is up to all of us to see that our public officials do their work honestly and with a certain amount of vision, that they do not just stick to the strict letter of the law but go out and do the thing in a whole-hearted, splendid way. In order that they may do that, it is up to us to see that they get sufficient appropriations, that they are able to pay sufficient salaries so that they can get and retain the right sort of men, and that they insist upon efficiency and do not countenance the retention in office of men who simply want to hang on to good political jobs.

PROFESSOR HENRY W. FARNAM, *Chairman*: I think that the form

in which the topic "State Promotion of Industrial Hygiene", is put, is calculated to awaken in the minds of many people a certain presumption against the proposition. When we talk of the state I think we are very apt to have in mind the old police state. "The state, I'm the state." We sometimes forget that we are the state, that the state is all of us in a democracy. The only question is whether this matter of industrial hygiene is sufficiently important for all of us to get together to try and put something through or whether it is a matter which can be safely left to the individual.

We have in our country a very good precedent for the action of the government in these matters. In the first decade after the adoption of the Constitution the government established a sick insurance and benefit fund for seamen. It was one of the first systems of the kind in the world. Here was a case where the government singled out a single profession or occupation, known to be particularly hazardous, and took extraordinary measures to provide for sickness. The remarkable thing is that in those early and simpler days apparently no one ever thought to contest the constitutionality of that measure, and the consequence was that it went on and we have developed a great medical system, the United States Public Health and Marine-Hospital Service, out of that small beginning which was an effort by the government to provide for the health of one particular occupation.

In connection with the very valuable suggestion thrown out by Dr. Overlock with reference to the establishment of hospitals for industrial diseases, it may be well to state that Dr. Devoto of Milan is expected to be in this country in September in attendance at the International Congress on Hygiene and Demography and I am sure I voice the sentiments of the Association in saying that we second heartily Dr. Overlock's suggestion and hope that someone who has money to give away wisely will establish such a hospital.

V
BIBLIOGRAPHY ON INDUSTRIAL HYGIENE

TRIAL LIST OF REFERENCES
ON
OCCUPATIONAL DISEASES AND INDUSTRIAL HYGIENE
Prepared by the
AMERICAN ASSOCIATION FOR LABOR LEGISLATION
UNITED STATES BUREAU OF LABOR
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WORKERS IN WHITE-LEAD FACTORY

REMOVING CORRODED WHITE LEAD FROM JARS IN WHICH IT HAS BEEN TRANS-
FORMED FROM METALLIC PLATES BY THE ACTION OF ACETIC ACID.

IMPROVISED RAG MUZZLES THE ONLY PROTECTION FROM
DEATH DEALING DUST

BIBLIOGRAPHY ON INDUSTRIAL HYGIENE

This preliminary list of titles is here printed in the hope that it may be found immediately useful to the rapidly growing group of Americans intelligently interested in industrial hygiene. Additions will be made to this list during the year. Copies of all publications on the subject are therefore urgently solicited in order that from this beginning there may be prepared a comprehensive bibliography, conveniently arranged and classified and fully annotated, for the guidance of all who wish to make future work still more effective.

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-Resolutions of the sixth delegates' meeting. (U. S. Bureau of labor. Bulletin no. 92, Jan. 1911, p. 182-193)
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- Account of death from effects of nitrous fumes of nine out of a bunch of thirteen men who inhaled the smoke of a single blast in the Gunnison Tunnel.
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- Contains information with regard to present conditions.
- Jones, J. D.** Effect of occupation on health of individuals. (Ohio State board of health report, 1886-7. Columbus, 1888, v. 2: 311-316. Also Cincinnati lancet-clinic, 1888, n. s. v. 21: 355-358.)
- Brief general article discussing workers in lead, file cutters, etc.
- Karasek, Stella, Karasek, Matthew.** Preliminary report on the injurious effects of metol, platinum, chromates, cyanides, hydrofluoric acid and of materials used in silvering mirrors. (Report of Illinois commission on occupational diseases, Jan. 1911, p. 96-98.)
- Results of original investigation.
- Keays, Frederick L.** Compressed-air illness, with a report of 3,692 cases. (Cornell university medical college bulletin, Oct. 1909, v. 2: 1-55.)
- Authoritative article by physician in charge of the East River Tunnels, New York.
-Compressed-air illness. (American labor legislation review, June 1912, v. 2, no. 2: 192-205.)
- Kelley, Florence.** The sex problems in industrial hygiene. (American journal of public hygiene, Boston. June 1910, v. 20: 252-257.)
- Brief plea for legal regulation of the hours of labor of women to prevent excessive fatigue.
- Kimball, D. D.** Ventilation and public health. (Annals of the American academy of political and social science, March 1911, p. 207-219.)
- General article, only incidentally relating to factory ventilation.
- King, William A.** Mortality statistics of the census in relation to occupations. (American journal of sociology, Sept. 1897, v. 3: 216-235.)
- Ten tables with discussion.
- Klink, Jane S.** The health of women workers. (Academy of political science, New York, v. 2, no. 2: 35-40.)
- Based on experience as welfare manager of a Brooklyn laundry.
- Knapp, C. P.** The caisson disease. (Lehigh valley medical magazine, Easton, Pa., 1891-2, v. 3: 1-12.)
- General discussion and history of 17 cases that came under his observation as surgeon during the sinking of two caissons for a coal mining company.
- Knapp, P. C.** A case of professional neurosis of co-ordination of unusual origin. (Journal of nervous and mental diseases, N. Y., 1887, n. s., v. 12: 41-45. Also reprint.)
- In a carpet maker, with general discussion of occupation neuroses.
- Kober, George Martin.** Industrial hygiene. A report of the committee on social betterment of the President's homes commission, 1908. Washington, D. C., iv, 8-175 p. (Also in reports of the President's homes commission, 60th Cong., 2d sess., Senate doc. 644, p. 25-107. Washington, 1909.)
- Comprehensive general treatise on conditions in 1907 in a considerable number of trades, with discussion of measures, legal and otherwise, which would improve conditions.
-Industrial hygiene. (U. S. Bureau of labor, Bulletin no. 75, March 1908, p. 472-591.)

- Similar to the above, with text of English laws for the regulation of dangerous and unhealthful industries.
- Korahet, M.** Diseases of occupation. (New York medical journal, 1911, v. 93: 1134-1137.)
- On effects of chronic fatigue, occupation dusts, industrial poisons, compressed air, woman's work, child labor, etc.
- Lane, Francis, Ellis, John B.** Miner's nystagmus. (Report of Illinois commission on occupational diseases, Jan. 1911, p. 155.)
- Brief report on investigations in Illinois.
- Laundries, Employment of women in.** (Report on condition of woman and child wage-earners in the United States, 61st Cong., 2d sess., Senate doc. 645, v. 12. Prepared under the direction of Chas. P. Neill, commissioner of labor. Effect of laundry work upon health, p. 25-118.)
- Results of thorough investigation of this industry in Chicago, New York, Brooklyn, Philadelphia, and Rockford, Ill.
- Law, James.** Report on the malignant anthrax in herds, and malignant pustule in men, in Livingston county, N. Y., in Sept. 1875. (American public health association. Reports and papers, v. 2: 465-467.)
- Describes three cases of anthrax in the manager of a farm and two German workmen.
- Laws, G. C.** The effects of nitro-glycerine upon those who manufacture it. (Journal of American medical association, Chicago, 1898, v. 31: 793-794.)
- Based on experience among employees of a large nitro-glycerine factory in New Jersey.
- Laws** relating to occupational diseases and industrial hygiene. (Twenty-second annual report of the U. S. commissioner of labor, 1903. U. S. Bureau of labor, Bulletins no. 85, 91 and 97.)
-Laws enacted during 1911 requiring the report of occupational diseases. (U. S. Bureau of labor, Bulletin no. 95, July 1911, p. 283-288.)
-Act providing for a tax on white phosphorus matches and for prohibiting their import or export. [Approved April 9, 1912.] (U. S. Bureau of labor, Bulletin no. 100, May 1912, p. 760-762.)
-Comfort, health and safety in factories. Comparative analysis of existing laws. (American labor legislation review, June 1911, v. 1, no. 2: 1-101.)
-Review of labor legislation of 1911. (American labor legislation review, Oct. 1911, v. 1, no. 3.)
- Lea, M. C.** On the poisonous effects resulting from the employment of arsenical preparations in the arts. (American journal of medical sciences, Phila., 1860, n. s. v. 40: 110-112.)
- Brief, general discussion of effects on employees and consumers, urging legislation to stop its use.
- Lead.** Hearings before the Committee on interstate and foreign commerce of the House of representatives, on H. R. 21901. Manufacture, sale, etc., of adulterated or mislabeled white lead and mixed paint. May 31, 1910. 52 p.
- Contains testimony on lead poisoning. See index.
- Leather industry.** Health conditions of the. Diseases and disease tendencies of occupations. (New Jersey bureau of statistics of labor and industries, twenty-ninth annual report, Camden, 1906, p. 209-234.)
- General discussion and statistics of health and accident conditions.
- Leupp, Constance D.** Phossy jaw. (Twentieth century magazine, Mar. 1912, v. 5: 28-35.)
- Popular article based on Dr. Andrews' investigations (q. v.).
- Levis, R. J.** Phosphor-necrosis. (Medical and surgical reporter, Phila., 1879, v. 41: 450-451.)
- Brief general description, based on observation of many cases in Philadelphia and Wilmington match factories, and description of a single case in a match factory worker.
- Lewis, G. L.** The effects of compressed air upon the human system, as evinced in the sinking of bridge piers during the construction of the Atchison bridge over the Missouri river. (Transactions of the medical society of Kansas, 1860-77, Lawrence, 1884, v. 1: 279-291.)
- History of use of compressed air, description of a caisson, and observations on some fifty cases which he treated as surgeon of the American Bridge Company.
- Lewis, Morris J.** The neural disorders of writers and artisans. (In Pepper's American system of practical medicine, Philadelphia, 1886, v. 5: 504-543.)
- Extended discussion of occupational cramps.

Library of congress. Division of bibliography. Select list of references on occupational injuries and diseases. Aug. 25, 1910. Typewritten 10 p.

Lincoln, David Francis. School and industrial hygiene. Philadelphia. Blakiston, 1880. American health primers. 144 p.

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Linenthal, Harry. Sanitation of clothing factories and tenement-house workrooms. (In Tuberculosis in Massachusetts, ed. by Edwin A. Locke, p. 28-36. Illustrated.)

Brief statement of conditions in men's clothing industry in Boston.

.....The prevention of occupational diseases. (Boston medical and surgical journal, May 23, 1912, v. 166: 779-783. Also reprint.)

Based on experience as state inspector of health in Massachusetts.

Lloyd, James Hendrie. The diseases of occupations. (In Stedman, Twentieth century practice. New York, 1895. v. 3: 309-496.)

Thorough treatise covering all the common occupational diseases, with brief review of the literature and of the legal restraints on the employment of women and children in the United States.

.....Occupation neuroses and poisonings in the arts and by foods. (In Modern treatment, ed. by H. A. Hare, 1910-1911, v. 2: 583-619.)

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Loeb, H. W. Railroad dust in railroaders' noses. (National association of railway surgeons. Official report of the fifth annual meeting, Chicago, 1892, p. 208-211.)

Diseases resulting from such dust.

Loomis, H. P. Miners' phthises. (Proceedings of the New York pathological society, 1891. N. Y., 1892, p. 52.)

Brief description of a lung, said to be an example of "miner's phthisis."

Lovejoy, O. R. Age problems in industrial hygiene. (American journal of public hygiene, Boston, June 1910, v. 20: 233-238.)

An argument for the legal regulation of child labor.

Maclay, J. W. Prize essay on the relations of the different professions and vocations to longevity. N. Y., 1873. 58 p.

MacLeod, J. J. R. Cause, treatment and prevention of the "bends" as observed in caisson sickness. (Association of engineering societies journal, Boston, 1907, v. 39: 283-302.)

An excellent, comprehensive article by a former associate of Leonard Hill in experimental work.

McCreedy, B. W. On the influence of trades, professions and occupations in the United States in the production of disease. (In the Medical society of New York. Transactions, 1836-1837. Albany, 1837. v. 3: 91-150.)

Historically interesting as the first general treatment of the subject in American literature. Describes the unhealthful conditions of work of seamen, women and children in textile factories, tailors, shoemakers, sewing women, printers, butchers, smiths, gold beaters, carpenters, painters, professional men, etc. "Prize Dissertation for 1837."

McConnell, J. W. Case of pronator spasm in a compositor. (Philadelphia polyclinic, April 28, 1894, v. 3: 161-162.)

Description of a single case.

.....An uncommon case of occupation neurosis. (Philadelphia polyclinic, March 20, 1897, v. 6: 123-124.)

In a brick sorter.

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Based on experience with between forty and fifty cases of this eye disease in oyster shuckers.

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General discussion of results of overcrowding.

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Brief account of personal investigations in 29 factories, stores and restaurants.

Manning, Wm. J. Health of employees in the government printing

- office, Washington. (U. S. Bureau of labor, Bulletin no. 75:497-508.)
Mainly description of methods in use for the prevention of lead poisoning.
- Marriott, W. McKim.** The air they breathe in New York factories. (Charities and the commons, Nov. 10, 1906, v. 17: 274-276.)
Results of an examination of air in a number of factories in New York City. Table and chart.
- Marshall, S. A.** [Caisson disease.] (Long Island medical journal, April, 1907, v. 1: 183-184.)
Based on experience among workmen in the Pennsylvania railroad tunnel. Discussion of Dr. Gallivan's paper (q. v.).
- Martin, John.** Factory legislation and tuberculosis. (Transactions of the Sixth international congress on tuberculosis. Washington, 1908. v. 3: 179-183.)
Brief discussion of dusty occupations and legislation providing for ventilation.
- Massachusetts.** First annual report of the work of the state inspectors of health. (In Thirty-ninth annual report of the State board of health of Massachusetts. Boston, 1907. p. 459-485.)
.....Second annual report. (In Fortieth annual report of the State board of health of Massachusetts. Boston, 1908. p. 653-750. Illustrated.)
.....Third annual report. (In Forty-first annual report of the State board of health of Massachusetts. Boston, 1909. p. 763-887.)
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.....Fifth annual report. (In Forty-third annual report of the State board of health of Massachusetts. Boston, 1911.)
These annual reports furnish a valuable source of information on factory and workshop conditions and methods by which they may be improved, and contain discussions of specific occupational diseases and dangerous processes. But they also cover tenement and schoolhouse hygiene, etc.
.....Massachusetts House documents no. 50, March, 1845; no. 153, 1850. (Reprinted in Documentary history of American industrial society, Cleveland, 1910, v. 8:133-186.)
Testimony on effect of long hours of labor on health of factory operatives.
- Mayo, Earl.** Work that kills. (Outlook, Sept. 23, 1911, v. 99: 203-213. Illustrated.)
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- Mears, J. Ewing.** Phosphorus necrosis of the jaws. (Philadelphia medical times, Jan. 9, 1886, v. 16: 264-275. Illustrated. Also Transactions American surgical association, 1885, v. 3: 357-385. Also reprint.)
Elaborate paper based on European sources and on examinations of a large number of employees in match factories, and the treatment of sixteen cases in this country.
- Meigs, Arthur V.** Caisson disease. A clinical lecture. (Philadelphia medical news, Nov. 28, 1885, v. 47: 580-592.)
Based mainly on Jaminet's, Smith's, Bauer's, and Clark's articles, and on Woodward's History of the St. Louis Bridge (q. v.).
- Memorial on occupational diseases.**
Prepared by a committee of experts appointed by the American association for labor legislation, and presented to the President of the United States. (American labor legislation review, Jan. 1911, v. 1, no. 1: 125-143. Also reprint.)
This memorial lays the groundwork for a federal investigation.
- Mercury.** Physiological effects of the mercury arc: its influence upon the eye. (Scientific American supplement, Oct. 7, 1911, v. 72: 235-236.)
Brief general article on artificial light, with only incidental reference to working people.
- Merk, Fred.** Industrial diseases. (Oration, University of Wisconsin, n. p. 1911. 5 p.)
- Mettler, L. H.** Occupation neuroses. (Clinical review, Chicago, 1904-1905, v. 21: 43-60.)
General discussion of various types of nerve disorders due to occupation.
- Middleton, P. Harvey.** White phosphorus horror. (Technical world magazine, April 1911, v. 15: 146-155. Illustrated.)
Popular article.
- Miles, Henry A.** Lowell as it was and as it is. Lowell, 1845. 234 p. "Provisions for the comfort and health of the operatives", p. 116-127.
Argues that the factory population, especially the women, were in good health.
- Miller, James A.** Pulmonary tuberculosis among printers. (Transactions of the Sixth international congress on tuberculosis. Washington, 1908. v. 3: 209-216.)

- Results of thorough physical examinations of 200 printers in New York City, with description of working conditions.
- Mills, Charles Karsner.** Occupation neuroses; affections of the neuromuscular apparatus due to special occupations. (In Loomis and Thompson, A system of practical medicine. v. 4: 597-610. New York, 1898.)
- Good general discussion of fatigue neuroses, occupation cramps and other forms of nervous disease due to occupation, with methods of treatment.
- Mental overwork and premature disease among public and professional men. (Smithsonian miscellaneous collections, no. 594. Washington, 1885, 34 p.)
- Moss, R. E.** Occupations. (Medical examiner and practitioner, N. Y., 1902, v. 12: 710-712.)
- Occupations as affecting insurance risks, giving diseases characteristic of a large number of different occupations.
- Moyer, H. N.** A rare occupation neurosis (shoe salesman's disease). (Medical news, Philadelphia, 1893, v. 62: 188-189.)
- Brief general discussion and description of a single case.
- Municipal ordinances, rules, and regulations** pertaining to public hygiene adopted from January 1, 1910, to June 30, 1911, by cities of the United States having a population of over 25,000 in 1910. Prepared by direction of the surgeon general. U. S. Public health and marine-hospital service. Washington, Gov't. print. off., 1912, 244 p.
- Murray, F. W.** Anthrax maligna. (New York medical journal, 1889, v. 49: 144-147. Also reprint.)
- General discussion, with a description of four cases, a porter in a restaurant, a longshoreman, a clerk, and a groom.
- Myers, R. M.** Cramps as affecting stokers. (Virginia medical semi-monthly, Richmond, 1897-8, v. 2: 552-553.)
- Observations as ship surgeon on one of the trans-Atlantic lines.
- Nearing, Scott.** Social adjustment. New York, Macmillan co., 1911, 377 p. Ch. xi. "Dangerous trades", p. 211-221.
- Brief, popular discussion.
- Neer, C. S.** The value of examination of the blood in the diagnosis of chronic lead poisoning. (Interstate medical journal, St. Louis, 1907, v. 14: 838-843.)
- General discussion and account of three cases, all occupational in origin.
- Nevin, John.** Occupational diseases. (Medical examiner and general practitioner, N. Y., Aug. 1908, v. 19: 254-256.)
- As affecting insurance risks.
- Newton, W. K.** An inquiry into the causes of disease among workers in silk, flax, and jute. (Tenth annual report of the board of health of New Jersey, 1886, Trenton, 1887, p. 188-194.)
- Describes processes and sanitary conditions in workrooms.
- Nicholl, R. H., Flinn, T. E., Hayhurst, E. R.** Effects of turpentine upon the health of workmen. (Report of Illinois commission on occupational diseases, Jan. 1911, p. 84-88.)
- Results of investigations of 62 men in Chicago.
- Nichols, Arthur H.** The effects on health of the use of sewing machines moved by foot-power. (Massachusetts State board of health report, 1872, p. 180-221.)
- Based on personal investigations and returns from many correspondents.
- Norton, H. G.** Dangers of the potters' trade from the life insurance standpoint. (Medical examiner and practitioner, New York, 1906, v. 16: 242-246.)
- Description of various branches of the work and their special dangers, with particular reference to the Trenton, N. J., potteries.
- Obenauer, Marie L.** Working hours, earnings and duration of employment of women workers in selected industries of Maryland and of California. (U. S. Bureau of labor, Bulletin 96.) Sanitary conditions in canneries, p. 359-362, 368, 401-403.
- Occupation mortality statistics.** Census of 1890. Deaths of males in certain occupations, in certain cities, and from certain causes. v. VII, Report on vital statistics, Part II, table 18, p. 1130. Washington, 1896.
- Census of 1900. Occupations in relation to deaths. Report on vital statistics, Part I, sec. xiii, p. ccxvii. Tables, p. 76. Washington, 1902.
- Bureau of the census. Annual reports on Mortality statistics, 1900-date.
- Connecticut registration re-

- ports, 1881-1907. Deaths by occupations in Connecticut for ten years, in report for 1906.
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-Vermont registration reports, 1857-1889, and health reports, 1900-1906.
-Rhode Island registration reports, 1853-1906.
-Rhode Island. Eighteenth annual report of the commissioner of industrial statistics, 1905. Mortality statistics of workmen in Rhode Island, 1899-1902. Tables, p. 53-152.
-New Jersey State board of health, annual reports, 1903-1907.
-Experience of thirty-four life companies upon ninety-eight special classes of risks. Compiled and published by the Actuarial society of America. New York, 1903, xiv, 479 p.
- Experience of leading life insurance companies with regard to specially hazardous occupations and groups of persons.
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-Mutual life insurance company of New York, mortality experience. N. Y., 1877. "Occupations", v. 2: 42-43.
-Connecticut mutual life insurance company, mortality experience, 1846-1878. Hartford, Conn. 1884. 54 p.
- O'Connell, James. Manhood tribute to the modern machine: influence determining the length of the trade life among machinists. (Annals of the American academy of political and social science, May 1906, v. 27, no. 3: 20-33.)
- Brief argument to show that high-speed machinery has shortened the life of the operator.
- Oliver, Thomas. Industrial lead poisoning, with descriptions of lead processes in certain industries in Great Britain and the western states of Europe. (U. S. Bureau of labor, Bulletin no. 95, July 1911, p. 1-188.)
- Thorough treatise by the chief English authority on the subject, based on English and European data.
- Oppenheimer, Seymour. Effect of certain occupations on the pharynx. (Medical record, N. Y., Dec. 16, 1899, v. 56: 891-893.)
- Results of study of 50 cases, effects of heat, e. g. a laundress and a tinsmith.
- Osgood, Irene. Women workers in Milwaukee tanneries. (Wisconsin Bureau of labor and industrial statistics, thirteenth biennial report, 1909, p. 1029-1172. "Health", p. 1060-1063.)
- Based on personal investigations.
- Overlock, Melvin George. The working people; their health and how to protect it. Worcester, Mass., The Blanchard press, 1910. 293 p.
- Brief, popular discussion of the prevention of disease in certain occupations (p. 89-96); hours and fatigue (p. 106-109); and the health of factory employees (p. 166-169).
-Education for the prevention of industrial diseases. (American labor legislation review, June 1912, v. 2, no. 2: 329-338.)
- Owens, John E. Caisson disease. (Railway surgical journal, Chicago, March 1908, v. 14: 254-263.)
- Based largely on his own experience as chief surgeon of the Illinois Central and Chicago and Northwestern railways.
- Parker, W. W. and others. Report on the effect of the use of the sewing machine on the health of women. (Transactions of the medical society of Virginia, third annual session, Richmond, 1872, p. 146-153.)
- Report of a committee, based mainly on Dr. Nichols' paper (q. v.).
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- Results of personal investigations of unhealthful processes and diseases to which women workers in these industries are subject, and methods by which the dangers

- could be reduced. Originally published in pamphlet form.
- Peet, Walter.** Pressing out "the bends" (caisson disease). (Harper's weekly, Feb. 17, 1912, v. 56:12.)
Brief, popular article on caisson disease and its treatment.
- Peirce, Paul S.** Industrial diseases. (North American review, Oct. 1911, v. 194:529-540.)
Good general article.
- Pelton, Henry H.** Treatment of compressed-air (caisson) illness. (American journal of medical sciences, Philadelphia, 1907, v. 133:679-685.)
Precautions against, types, and treatment of the disease, with description of a medical lock.
- Perry, S. H.** Brass-workers' disease. (Medical brief, St. Louis, 1907, v. 35:414-419.)
Description of the disease, with special reference to its occupational origin, by a physician of Birmingham, England.
- Peterson, F.** Three cases of acute mania from inhaling carbon bisulphide. (Boston medical and surgical journal, 1892, v. 127:325-326. Also reprint.)
All three in employees of a single rubber factory near New York City.
- Phosphorus matches (white).** Hearings before the Committee on ways and means of the House of representatives, 61st Congress, 3d session, on H. R. 26540 and H. R. 29469, December 16, 1910. Washington, Govt. print. off., 1910. 39 p. On bill (H. R. 29469) "A bill to provide for a tax upon white phosphorus matches, and for other purposes."
.....Hearings . . . December 16, 1910, and January 20, 1911. Washington, Govt. print. off., 1911. iii, 277-357 p. On H. R. 26540, H. R. 29469 and H. R. 30022. The Hearing of Dec. 16, 1910, is also pub. separately.
-Hearings . . . January 10, 1912. Washington, Govt. print. off., 1912, 110 p. On H. R. 2896.
-Hearings on bills relating to health activities of the general government, before the Committee on interstate and foreign commerce of the House of representatives. Washington, Govt. print. off., 1910, Part 6, p. 389-496.
These hearings, together with Dr. Andrews' report for the U. S. Labor Bureau (q. v.) contain most of the up-to-date, primary source material on phosphorus poisoning in the United States.
- Poisoning, Industrial.** (See Index catalogue of the surgeon general's library and Index medicus, under Lead, Mercury, Arsenic, Phosphorus, etc., passim.)
- Pietrowicz, S. R.** A case of brass molder's ague. (Journal of American medical association, Chicago, 1904, v. 43:465.)
In a brass molder in Chicago.
- Polishing and buffing.** (Fourteenth annual report of the New York state factory inspector, Albany, 1899, p. 32-35.)
Relates mainly to interpretation of the law as to the employment of women and children in polishing and buffing.
- Pottery industry, Health conditions in the.** Diseases and disease tendencies of occupations. (New Jersey bureau of statistics of labor and industries, twenty-eighth annual report, Trenton, 1905, p. 177-197.)
Description of processes and statistics.
- Pratt, Edward Ewing.** Occupational diseases. Preliminary report on lead poisoning in the city of New York, with an appendix on arsenical poisoning. (First report of New York factory investigating commission. 1912. Appendix vi, p. 365-569.)
.....Lead poisoning in New York city. (American labor legislation review, June 1912, v. 2, no. 2:273-280.)
- Price, George M.** Hygiene of occupation. (In Reference handbook of the medical sciences, ed. by Albert H. Buck, 1904, v. 6:316-333.)
Comprehensive discussion of the entire subject.
-Effects of confined air upon the health of workers. (American labor legislation review, June 1912, v. 2, no. 2:312-315.)
-Medical factory inspection. (Transactions of Sixth international congress on tuberculosis. 1908. v. 4, pt. 1:307-310.)
Brief outline showing the need for medical inspection of factories.
-Sanitation and ventilation of factories. (Academy of political science, New York, v. 2, no. 2:32-34.)
Brief discussion based on experience as special investigator for Joint Board of Sanitary Control and New York State Factory Investigating Commission. Not as complete as article in Labor Legislation Review (q. v.).

- Pritchard, J. F.** Diseases of railway men caused by their occupations. (American academy of railway surgeons report, 1896. Chicago, 1897, p. 136-144. Also (abstr.) Journal of American medical association, 1897, v. 28: 1169-1171.)
Especially nervous and mental diseases from strain of responsibility over life.
- Ramsey, M. E.** Practical life insurance examination. Philadelphia, 1908. "Occupation", p. 20-23.
Brief treatment of occupations as affecting insurance risks.
- Randolph, R. L.** A clinical and experimental study of the so-called oyster shucker's keratitis. (Johns Hopkins hospital bulletin, Baltimore, 1895, v. 6: 150-154.)
Description, with cases, of eye disease produced by injuries from oyster shells.
- Ravenel, M. P.** Anthrax. (In Osler's Modern medicine, 1907, v. 3: 42-51.)
Complete technical discussion, with statistics of occupations of persons affected with the disease.
- Raymond, Rossiter W.** Hygiene of metal mines. (In A treatise on hygiene and public health, ed. by A. H. Buck, v. 2. Ziemssen's Cyclopedia of medicine, v. 19: 253-264.)
Discusses ventilation, dust, temperature, etc.
-The hygiene of mines. (Transactions of the American institute of mining engineers, 1879-80, v. 8: 97-120.)
Practically same as his Hygiene of Metal Mines (q. v.), with quotations from Sheaffer's Hygiene of Coal Mines (q. v.).
- Reporting of industrial diseases.** New York State department of labor. Albany, 1912, 25 p.
Pamphlet for physicians containing the law, a statement of its purpose, and information in regard to the diseases to be reported and their symptoms.
- Reynolds, H. R.** Caisson disease. (Railway surgical journal, Chicago, Feb. 1909, v. 15: 255-59.)
- Rice, M. B.** White lead poisoning. (Alkaloidal clinic, Chicago, 1905, v. 12: 460-462.)
In painters and employees of white-lead factories.
- Riggs, C. Eugene.** Nervous disorders and paralyzes from excessive use of the parts affected—vertigo, tremor, and lead poisoning. (In System of practical therapeutics, ed. by H. A. Hare, Philadelphia, 1892, v. 3: 419-456.)
From medical standpoint, without regard to origin, but including writer's and telegrapher's cramp and lead poisoning.
- Rohé, George H.** The hygiene of occupations. (In American public health association. Public health papers and reports, 1884. Concord, N. H., 1885, v. 10: 165-173.)
Brief, concrete description of causes of disease in unhealthful trades, with general summary of American literature and Massachusetts mortality statistics.
- Royer, B. F., Holmes, E. B.** Fifteen cases of anthrax treated in the Philadelphia municipal hospital. (Therapeutic gazette, etc., Detroit, 1908, 3 s. v. 24: 6-17. Also Pennsylvania medical journal, Athens, 1907-8, v. 11: 937-949. Illustrated.)
Elaborate description of cases, all of which were occupational in origin, from handling hair, leather, etc.
- Russel, C. P.** Table of deaths from phthisis in New York city, showing relative mortality of various professions. (Medical record, N. Y., 1873, v. 8: 93.)
Statistics, without discussion.
- Ryan, L. M.** Compressed-air illness in caisson work. (American labor legislation review, June 1912, v. 2, no. 2: 350-355.)
.....Compressed-air disease from a clinical aspect. (New York medical journal, July 31, 1909, v. 90: 193-198. Also reprint.)
Describes the causes, methods of prevention, symptoms, types, and treatment, with the clinical history of two cases.
- Ryland, K.** Phosphorus necrosis of the maxillary bones, peculiar to lucifer-match makers. (St. Louis medical and surgical journal, 1854, v. 12: 28-34.)
Based mainly on European experience, but describes conditions of work in a St. Louis match factory.
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 - The Beginning of Occupational Disease Reports, John B. Andrews.
 - Accident Reports in Minnesota, Don D. Lescohier.
 - Advantages of Standard Accident Schedules, Edson S. Lott.
 - A Plan for Uniform Accident Reports, Leonard W. Hatch.
- No. 16: (American Labor Legislation Review, Vol. II, No. 1.) Proceedings of the Fifth Annual Meeting, 1911.
 - Relation of State to Federal Workmen's Compensation and Insurance Legislation.
 - Introductory Address, Henry R. Seager.
 - Compulsory State Insurance from the Workman's Viewpoint, John H. Wallace.
 - Accident Compensation for Federal Employees, I. M. Rubinow.
 - Constitutional Status of Workmen's Compensation, Ernst Freund.
 - Uniform Reporting of Industrial Injuries:
 - Report of Special Committee on Standard Schedules, Leonard W. Hatch.
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 - Introductory Address, Charles Nagel.
 - Unemployment as a Coming Issue, William Hard.
 - Experience of the National Employment Exchange, E. W. Carpenter.
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 - Introductory Address, Walter Fisher.
 - Work of the United States Bureau of Mines, J. A. Holmes.
 - Occupational Diseases in the Mining Industry, S. C. Hotchkiss.
 - A Federal Mining Commission, John R. Haynes.
- No. 17: (American Labor Legislation Review, Vol. II, No. 2.) Proceedings of the Second National Conference on Industrial Diseases, 1912.

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Life let us
cherish
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See 166 B. 42

The fundamental purpose of labor legislation is the conservation of the human resources of the nation.

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AMERICAN LABOR LEGISLATION REVIEW

Vol. II, No. 3



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INTRODUCTORY NOTE.

There was a time when the review of a year's labor legislation would have been regarded as a matter of mere academic interest. But times have changed.

To the faithful few who once sought the scattered labor laws in the elusive sheep-bound "session volumes", there have been added in recent years new thousands who appreciate the importance of labor legislation. And no longer need one say, as did an editor of a trade-union paper only four years ago, "We burn midnight oil in an effort to find out what labor laws have already been passed".

A review of the labor laws, in convenient form and available at the time when most needed, is a register of progress in a never-ending but increasingly interesting campaign. But it is more than that. A careful report upon the work accomplished during the last legislative sessions is an important step in the preparation for the next.

Time was when most labor bills were drafted over night and introduced next morning in the midst of busy legislative sessions. Hasty and ill-considered action is still too common. But in recent years much more attention has been given to careful bill drafting as well as to the legislative experiences of the different states. "Reasonable uniformity is an essential requirement", declares an able and progressive leader in a manufacturers' association, "and there is nothing that will promote uniformity and progress more than a general knowledge of laws already enacted."

Of special significance in the labor legislation of this year are two Massachusetts laws, one providing for minimum-wage boards and the other for reorganization of factory inspection. More stringent laws in several states requiring notification of industrial accidents and diseases, and the enactment of workmen's compensation measures by four additional states, are also of first importance. Federal labor legislation is noticeably increasing in volume,

and Congress this year enlarged the scope of the eight-hour and the government employees' accident compensation measures. Of more than ordinary significance, too, are the prohibition of poisonous phosphorus matches through the use of the taxing power, and the authorization of an industrial relations commission.

The recent adoption of new constitutions in Arizona and New Mexico, and of progressive constitutional amendments in Ohio, laid broad foundations for protective legislation in those states. The Arizona constitution, for example, called upon the legislature to pass a compulsory compensation act, while the Ohio constitution expressly provides that laws "fixing and regulating the hours of labor, establishing a minimum wage, and providing for the comfort, health and safety and general welfare of all employees" may be enacted and that "no other provision of the constitution shall impair or limit this power".

This, our fourth annual Review of Labor Legislation, supplements earlier publications, and, by bringing down to date the record of labor legislation in the United States, furnishes a basis for further constructive work.

For valued cooperation in the preparation of the section relating to workmen's compensation laws we are indebted to Prof. Ernst Freund, of the Chicago University Law School, and for the preparation of the tabular analysis on that subject to P. Tecumseh Sherman, Esq., of New York. To Dr. Helen L. Sumner is due the main credit for the long painstaking analysis of the remaining topics.

JOHN B. ANDREWS, Secretary,
American Association for Labor Legislation.

LABOR LEGISLATION OF 1912

I. ANALYSIS BY SUBJECTS AND BY STATES

The labor laws enacted by the thirteen states which held regular legislative sessions in 1912, and by the seven states which held special sessions during the year, are indexed below in alphabetical order by subjects and by states, with chapter references to the session laws of each state. The new federal laws, and the laws enacted by the two states (California and Texas) which held special sessions late in 1911, are also included. Since the Vermont legislature does not convene until October, the record of its session could not be included here.

ACCIDENTS AND DISEASES

A. REPORTING.

The movement for compulsory, uniform reports of industrial accidents and diseases, as a basis for investigation, for the classification of dangerous trades, and for preventive legislation, made distinct progress during the year.

a. ACCIDENTS.

Seven states enacted new or strengthened old laws relating to the reporting of accidents. In Massachusetts and New Jersey, laws passed in 1912 require all employers to report serious accidents to employees while at work, and in California all employers except those engaged in agricultural and similar pursuits and employers of domestic labor must report such accidents. In Rhode Island public utilities must report serious accidents, whether to employees or to patrons; in Virginia coal mine accidents must be reported; in Arizona reports are required of mine accidents and of accidents on public utilities; and in New Mexico fatal accidents in mines must be reported at once by telegraph or telephone.

Arizona.—Public service corporations are required to file with the corporation commission reports of whatever kinds or classes of accidents the commission may designate. These reports are not

admissible as evidence in actions for damages, but the commission must investigate the causes of all accidents. Penalty for a corporation, from \$100 to \$5,000, and for an officer, agent or employee, not exceeding \$1,000, or imprisonment for not more than one year, or both, for each offense. (C. 90, secs. 44, 76, 77. In effect, May 28, 1912). The state mine inspector must be notified immediately, in the quickest possible manner, of loss of life or serious accident in a mine, and the facts must be reported to him in writing. Penalty, from \$50 to \$300, or imprisonment for from thirty days to one year, or both. (C. 33, secs. 13 and 39. In effect, May 13, 1912).

California.—All accidents which arise out of or in the course of employment and which result in death or in disability lasting a week or more must be reported in writing by the employer, within fifteen days after their occurrence, to the industrial accident board. Employers in farming, dairying, agricultural and horticultural pursuits, poultry raising, and domestic service are excepted. The report must contain the name of the employer, the place and nature of the employment, the name, address, age, nationality, sex and occupation of the injured person, the length of time he had worked at the particular occupation, the date and hour of the accident, the hour when he began work on that date, the nature and cause of the injury, and the rate of wages. Employers must also keep records of all such accidents and these records must be open to the inspection of the industrial accident board. But no statement contained in a report is admissible as evidence in a legal action arising out of the injury. A supplementary report, containing complete statements as to payments made for medical or other care, claims for damages, and any compromise or settlement of such claims, must be sent in upon the termination of the disability or sixty days after the accident, if the disability extends longer than that period. And if any payment in settlement of a claim for damages is made thereafter it must be reported to the industrial accident board. Physicians who attend persons who are suffering from industrial accidents must also make reports, within ten days after their first attendance and also on the termination of the disability or of their attendance, giving specified information in regard to their patients' physical condition. Furthermore, employers' liability insurance companies must report monthly to the industrial accident board all injuries to employees reported to them, claims for damages filed and settlements or compromises made.

Employers, physicians, and insurance companies, moreover, must furnish whatever further information the industrial accident board may require in order to obtain a complete history of every injury and the damages or compensation paid. Penalty, from \$10 to \$100, or imprisonment for not more than thirty days, or both. (C. 53. In effect, March 10, 1912). The law of 1911 requiring reports of accidents on railroads is extended to cover accidents on all public utilities. These reports must be made to the railroad commission, which may investigate the causes of all accidents which have resulted in loss of life or injury to person or property. Neither accident reports nor orders or recommendations of the commission relating to accidents are admissible as evidence in actions for damages. (C. 14, sec. 44. In effect, February 21, 1912).

Massachusetts.—All employers, instead of merely those engaged in manufacturing and mercantile businesses, must report accidents within ninety-six hours, instead of "forthwith", to the chief of the district police (now to the board of labor and industries). As under the previous law, the accidents to be reported are those which occur while the employee is at work and which result in death or in such bodily injury as to prevent the employee from returning to work within four days. Employers must also keep records, open to inspection by the factory inspectors, of all such accidents. It is further provided that no statements in these reports shall be admissible in an action arising out of the accident. The penalty, which applies not only to failure to make the report, but to failure to keep the record, is raised from a maximum of \$20 to a maximum of \$25 and a minimum of \$10 for each offense. (C. 409. In effect, May 6, 1912).

New Jersey.—In lieu of the reports required by the act of 1911 to be made to the employers' liability commission, employers must notify the commissioner of labor in writing of all accidents "in any employment of labor" by reason of which an employee is unable to resume work within two weeks. The notification must contain the time, place, and cause of the accident, the extent of injuries, and any other facts which the commissioner may require. If the injury does not result in death, the report must be filed within four weeks after the accident, and if it results in death, within two weeks thereafter. Casualty insurance companies must furnish the com-

missioner with similar reports of the same class of accidents within four weeks after they have been notified of the injury, or within two weeks after they have been notified of the death of an employee insured by them. These reports may not be made public and may not be opened to inspection unless, in the opinion of the commissioner of labor, the public interest requires, but they are at the service of the employers' liability commission. They may not be used as evidence against an employer in any action for damages. Penalty, \$50 for each separate offense. (C. 156. In effect, March 26, 1912).

New Mexico.—Fatal accidents in mines must be reported at once by telegraph or telephone, and within ten days a full and complete report must be made in writing to the state inspector of mines. Complete records, to which the inspector has access, must be kept at mines of all accidents, whether or not they were fatal. (C. 80. In effect, September 6, 1912).

Rhode Island.—Every public utility must notify the public utilities commission of all accidents attended with loss of human life or serious injury, and the commission may investigate such accidents. (C. 795, sec. 49. In effect, April 17, 1912).

Virginia.—The state mine inspector must be notified forthwith of any explosion or other accident in a coal mine which has resulted in loss of life or serious personal injury. Penalty, from \$10 to \$500, and imprisonment for from ten to ninety days. (C. 178, sec. 17. In effect, June 13, 1912).

b. DISEASES.

Two new states, Maryland and New Jersey, are added to the list of six states which last year required physicians to report cases of certain occupational diseases. It is interesting to note, moreover, that the New York Department of Labor has requested physicians, as it is empowered to do under the 1911 law, to report all occupational diseases, and that the Maryland law of 1912, though enumerating the same diseases that must be reported in other states, specifically provides that physicians must report all diseases contracted as the result of employment.

Maryland.—Physicians are required to report to the state board of health all cases of industrial poisoning from lead, phosphorus, arsenic or mercury, or their compounds, or of anthrax, compressed-air illness, "or any other ailment or disease contracted as a result

MAIN PROVISIONS OF EXISTING LAWS RELATIVE TO REPORTING OF OCCUPATIONAL DISEASES.*

The analysis of the six laws of 1911 is in the smaller type.
The analysis of the two laws of 1912 is in the larger type.

STATE	DISEASES TO BE REPORTED	REPORTS TO INCLUDE	TO WHOM TO REPORT	PENALTY
California Ch. 485, Laws 1911. Approved April 21. In effect, June 20, 1911.	Anthrax, compressed air illness, and poisoning from lead, phosphorus, arsenic or mercury, or their compounds.	Name and full postal address and place of employment of the patient, and the disease.	State Board of Health, and thereby transmitted to the State Commissioner of Labor.	Not more than \$10.
Connecticut Ch. 159, Acts 1911. Approved July 18. In effect, Sept. 1, 1911.	Same as California.	Same as California.	State Commissioner of Labor.	None.
Illinois H. B. 250, Laws 1911. Approved May 26, 1911. In effect, July 1, 1911.	Law is obscure, but apparently includes poisoning from "sugar of lead, white lead, lead chromate, litharge, red lead, arsenate of lead or paris green," and "the manufacture of brass or the smelting of lead or zinc."	Name, address, sex and age of employee; name of employer and last place of employment; nature, probable extent and duration of the disease.	State Board of Health, and thereby transmitted to State Department of Factory Inspection.	First offense, \$10 to \$100; subsequent offense, \$50 to \$200.
Maryland Ch. 165, Laws 1912. Approved Apr. 8. In effect, Apr. 8, 1912.	Same as California, (and "any other ailment or disease contracted as a result of the nature of the patient's employment").	Same as California, ("and the nature of the occupation," and... "with such other specific information as may be required by the State Board of Health").	Same as California.	Same as California.
Michigan No. 119, Acts 1911. Approved April 25. In effect, Aug. 1, 1911.	Same as California.	Same as California, (and "the length of time of such employment").	Same as California.	Not more than \$50.
New Jersey Ch. 351, Laws 1912. Approved Apr. 1. In effect, July 4, 1912.	Same as California.	Same as Maryland.	Same as California.	For each offense, \$25.
New York Ch. 258, Laws 1911. Approved June 6. In effect, Sept. 1, 1911.	Same as California.	Same as California, ("with such other and further information as may be required by the Commissioner of Labor").	State Commissioner of Labor.	Same as California.
Wisconsin Ch. 252, Laws 1911. Approved June 2. In effect, June 5, 1911.	Same as California, (except that "anthrax" is omitted).	Same as California.	State Board of Health.	Same as California.

*In all states except Illinois the obligation to report falls upon every medical practitioner or physician; in Illinois, upon any physician making the required monthly examination of employees in certain specified industries. In all states except California and Connecticut where a fee of fifty cents is allowed, no compensation for reports is paid by the state.

of the nature of the patient's employment". Reports must state the name, address, and place of employment of the patient, and the nature of the occupation and the disease, "with such other specific information as may be required by the state board of health". The act is enforced by the state board of health, with the assistance of local boards of health and health officers, but all data is transmitted to the chief of the bureau of statistics and information, who is directed to include both the data and a summary in his annual report. Maximum penalty, \$10. (C. 165. In effect, April 8, 1912).

New Jersey.—Cases of occupational poisoning from lead, phosphorus, arsenic or mercury, or their compounds, or of anthrax or compressed-air illness must be reported within thirty days by the attending physician to the state board of health. The reports must contain the same information as in Maryland, and as in Maryland the state board of health enforces the act and transmits all data obtained under its provisions to the commissioner of labor. Penalty, \$25 for each offense. (C. 351. In effect, July 4, 1912).

B. PREVENTION.

a. FACTORIES AND WORKSHOPS.

Perhaps the most notable achievement of the year in legislation for the prevention of accidents and diseases in factories and workshops was the passage by Congress of the act placing a prohibitive tax upon the manufacture, and forbidding the importation, exportation, and sale of matches made with poisonous white phosphorus. This removes the common cause of phosphorus necrosis of the jaw bones. Another necessary step in the elimination of industrial poisoning was taken by New York, which now requires washing facilities and forbids eating in factories where lead, arsenic or other poisons are used. New York also enacted several laws designed to prevent accidents from fire.

Massachusetts.—The act relating to the safeguarding of machinery is extended to cover elevators and all machinery having movable parts, as well as belting, shafting, gearing and drums, not only as before in factories, but in mechanical establishments, workshops and mercantile establishments. No machinery except steam engines in any such establishments may be cleaned while in motion; and mechanical and mercantile establishments, as well as factories and

workshops, must be well lighted and ventilated and must be kept clean. (C. 318. In effect, April 24, 1912). No building newly erected in Boston may be occupied until means of egress in case of fire have been provided in accordance with plans and drawings approved by the building commissioner. (C. 369. In effect, April 3, 1912).

New Jersey.—The law relating to the ventilation of factories, workshops, mills, and other manufacturing establishments is amended to provide that rooms in which excessive heat is created, or where processes are carried on during which steam, gases, vapors, dust or other injurious impurities are generated, shall be “ventilated in such a manner as to render them harmless, so far as is practicable”—ventilation to be provided within twenty days, instead of as before, within “the time given . . . to make the change”. In places where glazing or polishing on a wheel, or any process is carried on, by which dust, gas, vapor, or other impurity is generated in such a manner as to be inhaled by employees to an injurious extent, the commissioner of labor may order the provision of a fan or other mechanical means of preventing such inhalation. Penalty for failure to comply with the order within twenty days, \$10 for each day's delay. (C. 5. In effect, July 4, 1912). In all manufacturing establishments, where machinery is used, friction clutches for stopping shafting, as well as belt shifters, must be provided. Power presses and foot presses are added to the list of machines which must be properly guarded. The commissioner of labor may order that any portion of a building, and not merely the halls, shall be provided with proper lighting facilities. (C. 6. In effect, February 26, 1912). The law relating to bakeries is entirely rewritten and is extended to places where candy, ice cream or frozen sweets, macaroni and other foodstuffs, as well as biscuits, pies, bread, crackers, cakes, and confectionery, are made “for the purpose of sale”. Sufficient light must be provided to prevent any place from being operated entirely by artificial light, and there are a number of other new provisions primarily designed to protect the public health. Inspections must be made once every three months, instead of once every six months as heretofore and, in addition to former penalties, it is provided that anyone who, after conviction for violation of the act, continues such violation is liable to a fine of \$100. There are several new sections in regard

to the recovery of penalties, and the commissioner of labor is given the right to file a bill for an injunction to prevent further violations. (C. 127. In effect, March 21, 1912).

New York.—Washing facilities, including hot water and individual towels, must be provided in factories where lead, arsenic or other poisonous substances or injurious or noxious fumes, dust or gases are present as an incident or result of the business. Employees are forbidden to take food into any room "in a factory, mercantile establishment, mill or workshop, commercial institution or other establishment or working place" where poisonous substances or injurious fumes, dust or gases are present in harmful conditions or harmful quantities. Notice to this effect must be posted in such rooms. Employees are forbidden even to remain in these rooms, unless their presence is necessary for the proper conduct of the business, during the time allowed for meals. Suitable provision to enable employees to take their meals elsewhere must be maintained in all such establishments. (C. 336. In effect, October 1, 1912).

The law relating to protection from fire is strengthened by three important amendments. In factories in which more than twenty-five persons are regularly employed above the ground floor, fire drills must be conducted at least once every three months under the supervision of the local fire department or one of its officers. The regulations to make this provision effective, prepared by the fire commissioner in New York and by the state fire marshal in other parts of the state, must be posted on each floor of every factory to which they apply. (C. 330. In effect, April 15, 1912). In factory buildings over seven stories or ninety feet high, in which more than two hundred people are regularly employed above that height and in which wooden flooring or wooden trim is used, automatic sprinkling systems must be installed by the owner within a year. But the fire commissioner for New York City and the state fire marshal for the rest of the state, who must approve all sprinkler systems installed, may for good cause extend the time for an additional year. Penalty, from \$20 to \$50 for the first offense; from \$50 to \$250, or imprisonment for not more than thirty days, or both, for a second offense; and not less than \$250, or imprisonment for not more than sixty days, or both, for a third offense. (C. 332. In effect, April 15, 1912). All factories must be provided

with properly covered, fireproof receptacles in which inflammable waste materials, cuttings, and rubbish must be deposited. Such materials must be removed from the floors not less than twice a day and must be entirely removed from a factory building at least once a day. Gas jets or lights in factories must be enclosed by globes, wire cages or other "proper protection". Smoking in a factory is prohibited, and a notice to that effect, stating the penalty, must be posted on every floor, in English and also in whatever other languages the fire commissioner in New York City, and elsewhere the state fire marshal, may direct. (C. 329. In effect, April 15, 1912). The quantity of explosives that may be kept in a factory building or magazine is carefully regulated. (C. 453. In effect, April 16, 1912). (See also "Administration of Labor Laws", p. 452).

Virginia.—In establishments in which one or more males and one or more females are employed together, instead of two or more as before, separate toilet facilities must be provided. Mercantile establishments are no longer excepted, and offices are excepted only under more stringent conditions than formerly. (C. 62. In effect, June 13, 1912).

United States.—A tax of two cents per hundred, which is practically prohibitive, is placed upon the manufacture of poisonous white or yellow phosphorus matches. Detailed rules are laid down for the manufacture and sale of such matches and for the affixing of adhesive stamps on packages. Heavy penalties, ranging up to \$5,000, or imprisonment for three years, or both, are provided for failure to observe these rules, and, in addition to these penalties, a manufacturer who defrauds or attempts to defraud the United States of the tax forfeits his factory and manufacturing apparatus and all his raw materials and manufactured matches. The administration of the act is in the hands of the Commissioner of Internal Revenue. The provisions of the act which relate to the manufacture of white phosphorus matches take effect July 1, 1913, and those which relate to their sale or removal take effect January 1, 1915. The importation of white phosphorus matches is forbidden after January 1, 1913, and their exportation is forbidden after January 1, 1914. (C. 75).

b. MINES.

Arizona, New Mexico and Virginia are added this year to the

states which give special protection to the lives and health of their miners.

Arizona.—Maps of mines which employ ten or more men underground must be made if ordered by the mine inspector, and must be revised every six months. The storage of explosives at mines is carefully regulated and it is provided that suitable devices shall be furnished and used for thawing or warming powder, and also that explosives shall be marked with the date of manufacture and shall not be sold or used after twelve months from that date. Metal tamping bars may not be used for charging holes, and the firing of charges is regulated in detail.

In mines which have shafts and drifts of a specified length, at least two outlets to the surface, thirty or more feet apart, must be provided. The character of these outlets is specified in detail, and it is provided that, if one of them is through an opening into another mine, the owners and operators of the respective mines are responsible for keeping their parts in proper repair and free from obstruction. In mines which have only one exit covered by a building containing the mechanical plant, furnace room, or blacksmith shop, there must be fire protection, water if possible, and if not, chemical fire extinguishers or hand grenades. And in all mines having only a single shaft, the shaft must be divided into at least two compartments, one of which must be set aside for a ladderway, equipped as specified.

No new structure may be erected over the outlet of a mine except hoisting apparatus and a hatch or door, or a house if that is necessary to protect men from inclemency of the weather and if authorized by the mine inspector. If a house is built it must be of non-inflammable material and must meet certain other requirements. Exits covered by houses must be provided with fireproof doors that can be closed from outside of the building. Slopes steeper than forty degrees must be provided with ladderways, and ladders of specified construction must be furnished at other specified places. There must be passageways around shafts at stations or levels; the tops of shafts and stations must be protected by gates or guard rails; and openings in the floor of a drift or stope must be kept covered by a substantial hatch or planking, or provided with guard rails. Lights must be provided at certain places; but candles must not be left burning when the user leaves his work for the day.

Methods of hoisting and the kind of hoisting machinery to be used are specified in great detail. No one who is addicted to the use of intoxicating liquors or drugs may be employed as hoisting engineer; men may not be hoisted at a speed greater than eight hundred feet per minute; all hoisting machinery must be inspected every twenty-four hours by a competent person and reports made in writing to the manager or superintendent of any defects found; the number of men allowed to ride on a cage or bucket must not be greater than the number determined by the mine inspector; men must not ride on a loaded cage or bucket; and the hoisting of tools, timber, and other materials is regulated. Men working in shafts must be protected from falling materials. Hoisting shafts more than fifty feet deep, if not exempted in writing by the mine inspector, must be provided with signaling apparatus of certain specified kinds. A new code of signals is provided.

The method of advancing drifts or inclines toward places suspected of being filled with water is carefully specified. An "adequate amount of pure air" must be made to circulate through all parts of mines; where necessary an "adequate" spraying system must be provided to settle dust or gases; and the maximum amount of carbon dioxide in the air is specified. Waste timbers must be removed as soon as practicable, and intoxicated persons are not allowed in mines. Mines which employ twenty-five men or more must provide heated wash-rooms and change rooms; and those which employ twenty-five men or more underground must provide at least two fire-fighting helmets, must train a crew in their use, and must test them at least once a month. Electric trolley wires must be at least six and one-half feet above the floor, and seven feet above the floor in mines hereafter equipped. All mines must keep a supply of first-aid remedies; at mines where ten or more men are employed a stretcher and woolen and water-proof blanket must be provided; at mines where more than one hundred men are employed this equipment must be doubled; and mines where three hundred or more men are employed must organize and procure the services of a competent surgeon and physician to instruct a first-aid corps. Certain acts, by which the lives or health of persons working in a mine might be endangered, are forbidden. At least one printed copy of this law must be kept in the office and in the time-keeper's office of every mine. Penalty, from \$50 to \$300, or imprisonment

for from thirty days to one year, or both. (C. 33. In effect, May 13, 1912). (See also "Administration of Labor Laws," p. 445).

Maryland.—The sum of \$25,000 is appropriated to build a hospital for the care of sick and injured miners in Frostburg, Allegany county, and provisions are enacted for the building and management of the hospital. (C. 441. In effect, April 8, 1912).

New Mexico.—In all coal mines at least two escape shafts, slopes or other outlets must be provided and kept available to employees. These means of egress must be separated as specified and a furnace shaft may not be deemed an escape shaft. In mines operated by shafts a stairway of specified construction must be placed in the second opening. All escapeways must be carefully inspected once a week by a competent employee appointed for the purpose, and reports of such inspections must be kept open to the state inspector of mines. In mines where workmen are compelled to travel the haulage road in the course of their ordinary duties, either a clear space, two feet in width, must be provided on one side of the haulage way, or there must be whitewashed refuge holes of specified dimensions not more than one hundred feet apart. Machinery for the transportation of persons in mines must be provided with adequate safety appliances and inspected at regular intervals by competent persons appointed for the purpose. Drags must be supplied to derail cars on inclines in case the rope or couplings should break. As soon as a uniform code of bell signals has been arranged by the mine inspector, copies of the code must be kept in each hoisting-engine house in plain view of the engineer, and on each level or entry.

In mines which have attained a depth or length of one hundred feet "all reasonable means" must be used to provide an "adequate amount of ventilation", which must be not less than one hundred cubic feet of pure air per minute for each person at work and not less than three hundred cubic feet of pure air per minute for each animal in the mine. Air must be forced to the face of every working place "in such a manner as to render harmless and expel therefrom all dangerous or poisonous gases". Fans must be placed as specified, and explosion doors must be provided in a direct line with the mine opening. At every coal mining camp where twenty-five or more men are employed each company or operator must keep at least four safety lamps, four electric hand lamps, and four masks or

helmets supplied with a specified amount of oxygen for use in rescue work. An ample supply of timbers must be provided and delivered at the request of the miners. Telephone systems must be installed in all mines "to such extent as may be reasonably required for the operation thereof".

In all mines "reasonable care" must be used to keep workings in operation free from standing gas. But in mines which vent explosive gases one or more experienced men must be employed as fire bosses. These men must test all working places and also all abandoned workings with safety lamps within three hours before each working shift enters the mine, must make written records of each examination, and must place a chalk mark on the face of the room showing the date and hour of the examination. If a fire boss discovers standing gas he must immediately place a danger sign at the entrance of the place and also some distance from the entrance. The use of naked lights in such mines is regulated. "Reasonable care" must be used to see that all brattice cloth is fireproof, that doors are as fireproof as possible, that inflammable material is not used to stop leaks, that doors are hung in such a manner as to close automatically, and that over-casts constructed after the passage of the act are of fireproof material.

The storage and use of powder is regulated. In mines employing twenty or more miners shot firers must be employed unless some approved mechanical or electrical shot-firing device is used. Shots must be fired between working shifts. When miners are allowed to load and tamp holes some incombustible substance must be provided for the purpose. Only pure animal or vegetable oils or other oils as free from smoke as these may be used for illuminating purposes. "Reasonable care" must be used by the operator to employ only experienced, competent and sober men as shot firers, fire bosses, engineers in charge of hoisting apparatus or engines, and persons in charge of explosives. Penalty for violation of any of the preceding sections, from \$50 to \$500, or imprisonment for from one to three months, or both.

Miners are forbidden to enter a mine or part of a mine generating explosive gas until it has been examined and reported safe by the fire boss. If a traveling way is provided it is unlawful for persons not required by their duties to do so to travel on the haulage road. Combustible material may not be used to tamp drill holes. Fire-

damp may not be brushed away with any article used by a movement of the hands or arms. Riding on mine cars is forbidden except in case of emergency, unless the engineer or person in charge of the trip has been notified. Miners must keep their working places safe by taking down dangerous coal and other material or by proper timbering, and they are forbidden to remain and operators are forbidden to require them to remain in an unsafe place except for the purpose of making it safe. Special rules are laid down for the loading and igniting of shot holes in narrow workings. Open lights may not be kept within five feet of a place where loose powder or explosives are being handled. The duties of shot firers are specified in some detail. Maximum penalty for violating any of the regulations summarized in this section, \$50, or imprisonment for not more than thirty days, or both.

No one but a regularly employed shot firer may ignite a shot in a mine where shot firers are employed except in rock work or in case of the absence or inability of the regular shot firer, and then only an experienced person appointed by the mine boss. Penalty, from \$50 to \$500, or imprisonment for from thirty days to two years. Anyone who interferes with or embarrasses a shot firer is liable to a fine of not more than \$100, or imprisonment for from thirty days to a year. Interfering with electrical apparatus is also forbidden under penalty of not more than \$100, or imprisonment for not more than six months, or both. The penalty for interfering with ventilating apparatus is somewhat greater, a maximum fine of \$100, or imprisonment for not more than one year, or both. Anyone who wilfully sets fire to a building or to any other equipment of a mine is liable to imprisonment for from five to twenty-five years, and if, as a result of his action, human life is lost, it is provided that he shall be deemed guilty of murder in the first degree. (C. 80. In effect, September 6, 1912). (See also "Administration of Labor Laws", p. 450).

Virginia.—Coal mines in which five or more persons are employed are subject to a new law, similar to the laws in force in other states. Maps, with details as specified, must be furnished the state mine inspector, and must be revised every six months. If an operator or agent fails to furnish the map, or if the commissioner of labor has reason to believe that it is incorrect, the inspector or commissioner may have one made at the expense of the operator,

or, if his map be found correct, at the expense of the state. Persons working inside a mine must be in communication with at least two outlets separated by natural strata as specified. There must be safe roadways, properly drained and free from obstructions, to both outlets, and if either be by a shaft the stairs or hoisting machinery must be in order and ready for immediate use at all times when the mine is in operation. Mines in which work is being prosecuted "with reasonable diligence" in providing outlets, removing obstructions or making repairs, and mines which are being prepared for abandonment, are excepted, provided that not more than twenty persons are employed at any one time. Mines worked by shaft must be provided with metal speaking tubes, approved safety catches and covers on cages, gates at the top of shafts, and brakes, which must be inspected once in every twenty-four hours "by some competent person", on the drums of hoisting machinery. There must be traveling ways of specified dimensions around the bottoms of shafts.

Competent and sober hoisting engineers must be employed; unauthorized persons are forbidden to interfere with machinery or interfere with or intimidate the engineer; not more than ten persons may ride on a cage or car; and no one may ride on a loaded cage or car. Roads used by both persons and cars must be wide enough to permit persons to pass moving cars with safety, or refuge holes as specified must be provided, but no person may use such road to travel on foot if other roads are provided for the purpose. The speed of cages is regulated; no cars may be hoisted while men are being lowered or hoisted; and no cage having an unstable or self-dumping platform may be used to carry workmen unless it can be securely locked.

Detailed regulations are laid down for ventilation. In all mines not less than one hundred cubic feet of air per minute, in mines generating firedamp not less than one hundred and fifty cubic feet of air per minute, and in both cases "as much more as the inspector may require" must be provided for each employee and must be circulated to the working places as specified. No one is permitted to work in places which cannot be supplied with the minimum amount of air, except for the purpose of making repairs necessary to comply with the law. Nevertheless, though an inspector, if he finds that a working place is being driven in advance of the ventila-

tion, may order the men to cease work in that place, he has specific authority to permit violations of this provision whenever he considers it safe and desirable. In all mines the accumulation of fine coal dust must be prevented as far as practicable by whatever methods the inspector may require. The inspector is also authorized to prescribe the conditions under which shooting from the solid may be done.

All persons are forbidden to injure shafts, lamps, air-courses, etc., to obstruct airways, carry matches or open lights in places worked by safety lamps, or disturb machinery, etc., in mines. Steam locomotives may not be used in mines or parts of mines where men are actually employed. Every operator must adopt special rules for his mine and these rules must be printed on cardboard, "in the languages spoken by ten or more employees", and posted in some conspicuous place about the mine. Printed copies must be furnished to each employee if requested. A standard is established for illuminating oils to be used in mines, and their sale, use and inspection are regulated in detail. But the provisions concerning oils apply only in case the inspector believes it necessary and notifies the operator of the mine in writing, or in case the owner or operator notifies the inspector that he wishes these provisions to apply.

In every coal mine in which ten persons are employed a competent foreman of at least five years' experience in a coal mine and having other specified qualifications must be employed, and it is his duty to watch over the ventilation, the removing or securing of loose coal, slate or rock, and the furnishing of props, caps and timbers. He must measure the air currents at least twice a month, at specified places, with an anemometer provided by the operator; must direct the progress of the work according to certain regulations; and must provide signals on haulways, lights for cars, and lights at the tops and bottoms of shafts. In large mines assistant foremen of at least three years' experience may be employed. The foreman or his assistant must visit every working place every alternate day while the miners are at work and must direct the use of props. If unable to comply with the legal requirements in any particular the foreman must notify the operator or agent, whose duty it then becomes to attend to the matter.

An operator who fails to furnish within a reasonable time the supplies necessary to enable the foreman to comply with the act, is

liable for damages in case loss of life or injury occurs to any employee by reason of his failure. At every mine where ten men are employed underground, the operator must provide a stretcher, a woolen and a waterproof blanket, and other requisites. If one hundred and fifty men are employed, two stretchers with the necessary equipment must be provided. After six months from the passage of the act employees, before going to work, must be instructed as to any unusual danger incident to their work which is known to or could reasonably be foreseen by the mine foreman or his assistant and, on request, must be furnished with copies of the law; and inexperienced employees must work under experienced miners until they have become familiar with the ordinary dangers.

Mines in which firedamp or "dangerous quantities of gas" are generated are subject to other special regulations. Doors in the main hallways must be strong and must close automatically. Unused workings and abandoned parts must be safeguarded to prevent the overflow of dangerous gases; warning notices must be posted; and workmen are forbidden to enter unused parts where there is gas. After blasting with a fixed amount of powder in a gaseous mine a miner must not resume work with a naked light within twenty minutes. Fans must be kept in operation night and day except on written permission of the commissioner of labor or the state mine inspector, or in the event of a necessary stoppage for repairs. If the fan stops, or if there is a heavy fall of roof which may obstruct the airway, the workmen must be immediately instructed to withdraw. At least two safety lamps must be kept at every coal mine, but mines in which explosive gas is generated in dangerous quantities must be worked exclusively by the use of locked safety lamps, which must be furnished by the operator and placed in charge of a fire boss.

Fire bosses, indeed, who understand dangerous gases and the ventilation of mines and who have had at least three years' experience in mines generating gases, must be employed in all such mines. The fire boss or bosses must examine the mine within three hours before each shift commences work. He must post at the entrance of the mine a danger signal which he must remove or change to a safety signal after his examination. In the performance of his duties he has no superior officer, but all inside employees are subordinate to him. No one may enter the mine until he has

given the signal, except under his direction to assist him in making the mine safe.

It is specifically stated that nothing in the act shall relieve the mine owner or operator of the common-law duty of providing for the reasonable safety of their employees, and that the foreman, boss and fire boss shall be considered as vice principals. The penalties are different for violation of different sections of the act, but range from \$5 to \$500, or from imprisonment for from ten days to one year. (C. 178. In effect, June 13, 1912). (See also "Administration of Labor Laws", p. 454; "Child Labor", p. 463; and "Woman's Work", p. 501).

C. RAILROADS AND STREET CARS.

Arizona.—The number of men to be employed on trains and engines is regulated in great detail according to the character and use of the train or engine. Penalty, \$100 for each offense. (C. 16. In effect, May 7, 1912). Locomotives from which steam escapes to such an extent as to obstruct the view of the men operating them may not be used, except in case of accident to finish a trip. Penalty, from \$100 to \$1,000. (C. 30. In effect, May 13, 1912). Freight trains are limited to seventy, and passenger trains to fourteen cars. Penalty, from \$100 to \$1,000. (C. 43. In effect, May 16, 1912). Anyone who operates a locomotive engine without having had three years' previous experience as a fireman or engineer, and anyone who acts as a conductor on a railroad train without having had three years' previous experience as a brakeman or conductor on a freight train, is liable to a fine of from \$25 to \$500, and every day's work constitutes a separate offense. To "engage, promise, require, persuade, prevail upon, or cause" anyone so to work is a misdemeanor subject to the same fine. But the act does not apply to switching, nor to railways less than twenty-five miles long, nor in case of the disability of an engineer or conductor while on the road; and in case of emergency temporary engineers or conductors may be employed until trains reach their terminals. (C. 47. In effect, May 16, 1912). All persons not required in the course of their employment to care for switch lights or fixed signals on railroad lines are forbidden "to tamper with, alter, change or remove" any such lights or signals. Penalty, from \$100 to \$500, or imprisonment for not exceeding twenty years, or both. (C. 63. In effect, May 18,

1912). Locomotive engines, except switch engines, must be equipped with electric headlights. Penalty, from \$100 to \$1000. (C. 27. In effect, November 10, 1912, or within such additional time as may be prescribed by the corporation commission). The corporation commission has power to require public service corporations to safeguard the health and safety of their employees, as well as of passengers, customers, and the public. It may prescribe, among other things, the use of appropriate safety or other devices, including interlocking and other protective devices at grade crossings and block or other systems of signaling, and it may establish standards of equipment. (C. 90, sec. 42. In effect, May 28, 1912).

Mississippi.—The state railroad commission is empowered to require railroads and all persons or corporations engaged in like business to provide sheds with water-tight roofs over tracks on which cars are commonly or regularly placed for repairs, and to provide proper drainage to keep such tracks dry and sanitary. (C. 152. In effect, January 1, 1913). Street cars operated from November 1 to March 15, in cities of 5,000 population or more, must be equipped with complete vestibules and provided with some means of heating so as thoroughly to protect employees from cold and inclement weather. Penalty, from \$50 to \$500. (C. 148. In effect, November 1, 1912).

United States.—The provisions of the post-office appropriation act of 1911 relating to the safe construction of railway post-office cars are strengthened. After July 1, 1917, no car may be paid for or used which is not constructed of "steel or steel underframe or equally indestructible material"; after June, 1913, not less than a fourth of the wooden cars must be replaced annually by steel cars; and all new cars must be of steel. (C. 389. In effect, August 24, 1912).

d. MISCELLANEOUS.

Massachusetts.—Passenger elevators must be provided with a suitable seat for the operator. Maximum penalty, \$20. (C. 479. In effect, May 12, 1912).

New York.—The act of 1909 relative to the use of compressed air in caissons, tunnels and other works, the only specific law upon this subject in the United States, is amended to permit certain technical changes. The time of decompression of workers in caissons

is reduced from two minutes for every three pounds for pressures under thirty-six pounds and one minute per pound for greater pressures, to a sliding scale varying from one minute for pressures under ten pounds to twenty-five minutes for pressures from forty to fifty pounds per square inch. The rate of decompression for tunnel and other compressed-air workers remains as formerly for caisson workers. It is provided that the instruments for showing pressure must be in charge of a competent person who may not be employed more than eight out of every twenty-four hours. The provisions in regard to the employment of medical officers are slightly modified. Employees must be reexamined after ten, instead of after three days' absence from work. Persons who have never before worked in compressed air may, after examination, work for a half-day period, instead of only for half a period, under the former detailed regulations in regard to hours in relation to pressures. Even if, on reexamination, it is found that the physical condition of such employees does not qualify them for the work, the law is modified so that they may be permitted to work in places where the pressure is less than fifteen pounds. The medical lock, instead of being directly in charge of the medical officer, must be in charge of a certified trained nurse, selected by the officer, who must be qualified to render temporary relief. Two new sections are added providing that in all compressed-air work there shall be at least two air pipes or lines connected at all times and in perfect working condition, and that, when electricity is used for lighting, the light supplied for the shaft shall be from a wire different from that supplying light where the men are actually working. (C. 219. In effect, September 1, 1912).

ADMINISTRATION OF LABOR LAWS

The most important administrative measure of the year was the act creating the state board of labor and industries in Massachusetts. This board of five persons takes over the enforcement of practically all the labor laws of the state, including those formerly enforced by the district police and by the state board of health. This measure, though quite different from that of Wisconsin, described last year, and lacking some of the best features, notably the safeguarded elasticity, of the Wisconsin plan, is a step toward more uniform and efficient administration of labor laws.

In several states the number of factory inspectors is increased and there is an evident tendency to provide for the employment of women inspectors to enforce the laws relating to woman's work. The tendency toward specialization within departments noted last year is also evident in the acts of 1912. The New York laws requiring the registration of factories, and extending the time of the factory investigating commission should also be noted. Arizona, New Mexico and Virginia created departments of mines to enforce their new laws for the protection of miners.

Arizona.—The office of state mine inspector is created. The inspector is elected biennially and appoints three deputies. All four must be at least thirty years of age; must have had at least seven years' experience in underground mining; must not be employees, directors or officers of any mining, milling, or smelting company; must devote their entire time to the duties of their offices; and must not act for or receive compensation from any candidate for office or any political party during their terms of office, on penalty of removal. The salary of the inspector is \$3,000, and the deputies receive \$1,400. Each is entitled to traveling expenses not to exceed \$1,400, and there is an allowance of \$1,400 for clerk hire and office expenses. The inspectors must file bonds and are forbidden to make reports on mines except to their superior officer or to the governor, and also to reveal any knowledge obtained in the exercise of their duties.

The inspector or one of his deputies must visit every mine in the state which employs fifty or more men underground at least every three months, and every other working mine employing six or more

men at least once a year, and oftener if he believes it necessary for the safety of the men employed, and must investigate a specified list of points relating to safety and also the cause of all accidents. Power is given the inspector and his deputies to examine any mining plant or equipment, and operators and employees are directed to give the inspectors whatever assistance is necessary. When an inspector finds that a mine is in a dangerous condition or that it fails to comply with the provisions of the law, he must notify the operator or agent in writing of the exact defect and the changes necessary to make the mine safe, specifying the time within which the change must be made. In case of legal action on account of injury due to the danger specified and which occurred after the notice was given, a certified copy of the notice is *prima facie* evidence of negligence on the part of the employer. If, on reexamination, it is found that the specified changes have not been made, the inspector may order the operator not to permit employees in the mine or in the part where danger exists except for the purpose of remedying the defects. When complaints of dangerous conditions are made in writing to an inspector he must examine the mine as soon as possible, and the names of persons making such complaints must be kept secret. Penalty for an operator who violates any of the sections outlined in this paragraph, from \$100 to \$500, or imprisonment for not more than one year, or both.

The inspector must investigate all serious accidents and, in case of loss of life, must appear at the coronor's inquest to examine witnesses with a view to ascertaining the cause. If he considers that the facts warrant it he must turn over all records of the case to the prosecuting officer of the county, together with a statement showing in what particular he believes the law to have been violated. Full records of inspections, including dangerous defects found, must be entered by the inspector in a book kept at the mine, and this book must be open to examination by all inspectors, operators, and miners. Annual reports containing, among other things, statistics of accidents, must be published. The terms "mine", "operator", "inspector", "deputy inspector", "excavations" and "workings" are carefully defined. (C. 33. In effect, May 13, 1912). (See also "Mines", p. 434). The appropriation from May 14, 1912, to June 30, 1913, totals \$15,350. (C. 92. In effect, May 28, 1912). A penalty of from \$100 to \$300 for each offense is provided for violations of

the eight-hour law for hoisting engineers at mines and furnace men at smelters. (C. 26. In effect, May 10, 1912).

To enforce the new child labor law inspectors of factories (though there is no provision for such inspectors) and other authorized inspectors and school attendance officers are empowered to visit establishments, make complaints, and prosecute for offenses. (C. 32. In effect, May 13, 1912). (See also "Child Labor", p. 456).

Illinois.—No more than \$1,000 a year is to be paid to any one mine inspector. (Second Special Session, 1912, S. B. 10, p. 31. In effect, June 6, 1912). The state factory inspector has an appropriation for two female investigators at salaries of \$1,000 a year each. (Second Special Session, 1912, S. B. 10, p. 34. In effect, June 6, 1912).

Kentucky.—A woman labor inspector and a woman assistant labor inspector are provided for, at salaries of \$1,200 and \$1,000 respectively, to enforce the new law relating to woman's work. They have the same powers and duties as the male inspector and assistant inspector. (C. 108. In effect, June 10, 1912). (See also "Woman's Work", p. 495).

Maryland.—For the enforcement of the woman's work law an inspector with a salary of \$800 and expenses and two assistant inspectors with salaries of \$600 and expenses, are provided. All three must be women and are appointed by the governor for terms of four years. They are authorized to enter any room in the establishments subject to the law, and are directed to visit such establishments as often as practicable during reasonable hours, and to report violations of the law to the state's attorney and the grand jury of the county or city. Appropriation, \$6,000 a year. (C. 79. In effect, May 1, 1912). (See also "Woman's Work", p. 496).

The number of inspectors to enforce the child labor law is increased from six to eight, and the chief of the bureau of statistics and information is authorized to employ one or more regular physicians, at a total compensation of not over \$2,500 to be paid by the city of Baltimore, to aid in the enforcement of that law. Appropriation, \$12,000 a year. (C. 731. In effect, December 1, 1912). (See also "Child Labor", p. 458). The compulsory school law, and especially the provisions relating to its enforcement in the city of Baltimore through attendance officers, who also aid in enforcing

the child labor law, are strengthened. (C. 173. In effect, August 1, 1912).

Massachusetts.—A state board of labor and industries is established and to it are transferred all the powers and duties with reference to the enforcement of labor laws which have hitherto belonged to the state board of health and to various departments of the district police, with the exception of those which relate to boiler inspection and to the inspection of buildings under erection, alteration or repair. The board is composed of five persons, one an employer, one a wage-earner, one a physician or a sanitary engineer, and at least one a woman. The members are appointed by the governor for five-year terms, so arranged that the term of one member shall expire each year. The chairman receives \$1,500 and the other members \$1,000 a year. The board is authorized to investigate conditions in any line of industry, to receive complaints concerning conditions or alleged violations of laws, to employ experts and other necessary assistants, to make rules for carrying out the provisions of the act, and to direct prosecutions.

The board appoints and may remove the commissioner of labor, whose term of office and salary (not less than \$5,000 nor more than \$7,500) it determines, and who must devote his entire time to the work. The law also authorizes the appointment of two deputy commissioners, one of whom must be especially qualified to enforce the laws relating to health; and provides for twenty-four inspectors and clerical assistants, at least four of whom must be women, and all of whom are subject to the civil-service laws. Inspectors of factories and buildings already employed may be transferred without examination and without regard to age, but new appointees must not be over forty-five years of age at the time of their first appointment. Only persons admitted to practice medicine may serve as industrial health inspectors. The salaries of inspectors are determined by the board but may not be less than \$1,500 a year. They have the same police powers that have been granted by previous laws to members of the inspection department of the district police. The maximum penalty for an inspector "who directly or indirectly receives a reward, gift or gratuity on account of his official services" is \$100, or imprisonment for three months, and discharge. The commissioner of labor may divide the state into inspection districts and assign as many inspectors to each district as he considers necessary.

The term "buildings used for industrial purposes" is carefully defined, and it is provided that eighteen of the present building inspectors shall remain members of the district police force. It is also specially stipulated that, though the duty of watching over the health of minors in factories is transferred to the state board of labor and industries, nothing in the act shall prevent the state inspectors of health from entering buildings used for industrial purposes, and also that the board of labor and industries must report to the state board of health all cases of disease in industrial establishments which may affect the health of the community. The act does not affect the duties of the bureau of statistics. Copies of all accident reports required to be filed with the industrial accident board must also be filed with the board of labor and industries, under penalty of \$50 for each failure. The board must make annual reports of its work and its expenditures, estimates of the sum needed for the next year, and recommendations for whatever additional legislation it may deem necessary. (C. 726. In effect, June 1, 1913, except the parts relating to the appointment of the board, of the commissioner, deputy commissioners and necessary clerical assistance, which take effect, March 1, 1913).

The enforcement of the new law in regard to the employment of women in core rooms is placed in the hands of the state inspectors of health (C. 653. In effect, June 26, 1912), and that of the law requiring seats for elevator men in the hands of the inspectors of factories and public buildings of the district police. (C. 479. In effect, May 12, 1912). The act just described, however, transfers the enforcement of all such laws to the state board of labor and industries. (See also "Woman's Work", p. 499, and "Miscellaneous", p. 443). The act relating to the inspection of steam boilers is strengthened and the inspectors are given power to order defective or dangerous boilers discontinued from service. (C. 531. In effect, April 25, 1912).

New Jersey.—The appointment of two additional factory inspectors, one a practical, skilled baker and the other a practical, skilled metal polisher and buffer, is authorized. (C. 67. In effect, March 13, 1912). The assistant commissioner and all inspectors of the department of labor are placed in the competitive class in the classified civil service. (C. 83. In effect, March 14, 1912). The salary of the commissioner of labor is raised from \$3,500 to

\$6,000 a year, and the qualifications of the assistant commissioner are somewhat changed. (C. 117. In effect, March 21, 1912). Establishments which come under the new woman's work law must be inspected by the department of labor. (C. 216. In effect, October 1, 1912). (See also "Woman's Work", p. 500).

New Mexico.—The office of state inspector of mines is created, and the governor, the state engineer and the president of the school of mines constitute an examining board for applicants. The inspector is appointed by the governor, and has no assistants. In addition to other requirements as to age, citizenship, and residence in the state, he must have had at least three years' experience in New Mexico and at least five years' practical experience in coal mines in the United States; must have a practical knowledge of mining engineering, timbering and ventilating, of the nature, properties, and methods of dispelling noxious and poisonous gases, and of methods of guarding against explosions; and must not be interested financially or otherwise in any coal mine in the state. His salary is \$2,000, and he gives bond for \$3,000.

Every coal mine in the state must be inspected as often as, in the opinion of the inspector, may be necessary. Whenever the inspector learns of an explosion or other accident in a mine, by which the lives of men are jeopardized or in which fatalities have occurred, he must proceed without delay to the spot to render whatever aid he can. If he finds in a mine improper construction or lack of "reasonable and proper machinery and appliances for the safety of miners and other employees" he must notify the operator that the mine is dangerous and require that the defect be remedied within a time named in the notice. He is especially directed to inspect and test hoisting apparatus; within six months after the passage of the act he must arrange a uniform system of bell signals and furnish a copy of these signals to each mine owner, operator or manager in the state; and he must make annual reports of his work. The inspector is given power to enter and inspect mines at any reasonable time, to inquire into all matters relating to the safety of employees, and to require that some person of practical experience and responsibility representing the owner, operator or manager, shall accompany him on his trips of inspection in order that he may point out defects. He must also keep a record in his office of all inspections. Though he is especially directed to en-

force the law relating to the protection of employees in coal mines, he apparently has power to order any unsafe condition remedied. The owner, operator, or manager, however, has the right of appeal to the district court as to the necessity or reasonableness of an order of the inspector. Penalty for refusal to allow the inspection to be made, from \$50 to \$500, or imprisonment for from one to three months, or both. The state must provide the mine inspector, not only with a suitable office and supplies, but with an anemometer, a barometer, safety lamps, and other necessary appliances and instruments. (C. 80. In effect, September 6, 1912). In addition to provision for the salary of the state mine inspector, \$2,000 is appropriated for contingent and traveling expenses for the first year, and \$1,950 for the second year. (C. 83. In effect, June 14, 1912). (See also "Mines", p. 436).

The enforcement of the law relating to the hours of labor of railroad employees is placed in the hands of the district attorney and of the corporation commission. The latter must lodge with the proper district attorneys information of any violations which come to its knowledge, and the district attorneys must bring suits upon satisfactory information and must withhold the name of the person furnishing the information. The railroad company is held responsible for all acts of its officers or agents. In case of the failure of a district attorney to bring suit in such cases the attorney general must cause prosecution to be commenced. (C. 62. In effect, September 6, 1912). (See also "Hours of Labor", p. 479).

New York.—The number of factory inspectors is increased from eighty-five to one hundred and twenty-five, by the addition of forty inspectors to the second grade at annual salaries of \$1,200 each. The maximum number of women inspectors is increased from fifteen to twenty. (C. 158. In effect, April 5, 1912). The powers of the commissioner of labor and his assistants are increased by authorizing them to serve process in criminal actions, and confidential agents of the commissioner, mine inspectors, and tunnel inspectors are given the same powers. (C. 382. In effect, April 15, 1912). The owner of every factory must register his factory with the state department of labor, giving his name, his home and his business address, the name under which his business is carried on, the number of employees, and any other data required by the commissioner of labor. Existing factories must be registered within

six months and new factories within thirty days after they commence business. Whenever the location of a factory is changed the new address must be reported within thirty days. (C. 335. In effect, April 15, 1912). The power of the commissioner of labor to affix labels containing the word "unclean" to articles which have been exposed to contagious disease is extended to cover articles found in any factory, instead of merely in tenant factories in which certain specified articles are made. (C. 334. In effect, April 15, 1912).

The laws relating to the powers and duties of the state fire marshal and of the fire commissioner of New York City are amended and important changes are made. These officers are directed to enforce the new laws relating to fire drills and to automatic sprinklers. (Cs. 330 and 332. In effect, April 15, 1912). They also enforce the provision relating to smoking in factories. The fire commissioner in New York City, but the commissioner of labor elsewhere, must approve the number, style and location of waste receptacles and the protective devices for gas jets. (C. 329. In effect, April 15, 1912). The lessee, as well as the owner or occupant of a building, is made liable for compliance with orders of the state fire marshal. The marshal is given the power to carry out his own orders by causing buildings to be demolished or explosives to be removed or destroyed; he may prosecute in the criminal courts any owner or occupant who fails to comply with orders in regard to fire escapes; he may order the use of boilers discontinued until they are put in a safe condition and may prosecute in the criminal courts owners or lessees who fail to comply with such orders. Investigations of the cause, origin, and circumstances of all fires and explosions are to be made. This law does not apply to New York City. (C. 453. In effect, April 16, 1912). But the officers and employees of the bureau of fire prevention of New York City are given the same powers as peace officers in all cases arising under fire laws or ordinances, and are empowered to make and enforce general regulations or special orders respecting fire drills, not only in factories, but in stores and other business establishments. (C. 458. In effect, April 18, 1912). (See also "Factories and Workshops", p. 432).

The number of special investigators to be appointed by the commissioner of labor for the work of the bureau of industries and

immigration is increased from twelve to whatever number is necessary to carry into effect the powers of the bureau, and the appointment of other assistants is authorized. The powers of the commissioner of labor to inspect labor camps and employment and contract labor agencies are enlarged so that he may inspect any camp which he has reasonable cause to believe is a labor camp and any agency which he has reasonable cause to believe deals with aliens. He must also inspect all immigrant lodging places and places where he has reasonable cause to believe that aliens "are received, lodged, boarded, or harbored". He may investigate complaints of fraud and extortion, not only by public officials, but by any other persons or corporations. Investigations or hearings may be held, not only before the commissioner or the chief investigator but before any official whom the commissioner may designate. All such investigators are given power to subpoena witnesses, to examine books and other records and compel their production, and to effect as far as practicable an amicable settlement of the complaint. (C. 543. In effect, April 19, 1912). Appropriation for the department of labor to pay the salaries of three employees to enforce the law relating to the licensing and regulation of immigrant lodging places, \$2,850. (C. 87. In effect, April 2, 1912). (See also "Immigration", p. 481).

The term of the factory investigating commission, created in 1911, is extended another year, and \$60,000 is appropriated for its use. It must report its proceedings and recommendations to the legislature on or before January 15, 1913. (C. 21. In effect, March 6, 1912). An appropriation is made for printing 5,000 additional copies of the report already submitted. (C. 547. In effect, April 19, 1912).

South Carolina.—The commissioner of agriculture, commerce and industries is to be elected, instead of appointed, and the provisions relating to his qualifications are revised. (No. 346. In effect, February 23, 1912). He is charged with the duty of enforcing the new law relative to the employment of children as messengers in cities of over 5,000 population, and for that purpose is given the right to enter buildings, send for persons or papers, institute prosecutions, etc. Penalty for impeding him or his agents in their duties, \$10 to \$50, or imprisonment for from ten to thirty days. (No. 405. In effect, July 1, 1912). (See also "Child Labor", p. 463).

Virginia.—A department of mines is created within the bureau of labor and industrial statistics. The state mine inspector, who is appointed by the commissioner of labor and industrial statistics, must have had at least five years' experience in coal mining, and must understand the different systems of working and ventilating coal mines. He must keep a record of and report all inspections made by him to the commissioner of labor and industrial statistics, who shall publish the record in his annual report. He must visit each mine once in six months or oftener if called on in writing by ten men engaged in, or by the owner, operator or superintendent, of a mine. He posts a certificate of inspection in a prominent place at or near the mine. Penalty for an inspector who fails to enforce the act, from \$50 to \$250 and dismissal. Operators or agents of coal mines must furnish the inspector proper facilities for entering and examining their mines. The inspector must notify the operator or agent in writing of any failure to comply with the provisions of the law or of any dangerous conditions which he may find; and, if he deems it necessary for the protection of the lives or health of the employees, after one day's notice to the operator or agent, he must notify the state mine inspector, who must immediately examine the mine and, if he finds it unsafe, must order it closed until it is made safe. Appeal may be made, however, to the circuit court, the judge of which finally determines whether the mine is in a reasonably safe condition. In case of an accident the inspector, if he deems it necessary, must go immediately to the scene and investigate the cause, and for this purpose he has the usual powers to compel the attendance of witnesses and administer oaths. Operators must make annual reports to the inspector on blanks furnished by the commissioner of labor. The mine inspector must also be notified of changes in the ownership of coal mines. Penalty for failure to make these reports, from \$50 to \$500, or imprisonment for from thirty to ninety days. (C. 178. In effect, June 13, 1912). (See also "Mines", p. 438). No appropriation is made in this act, but in the general appropriation act the commissioner of labor is allowed \$7,600 a year, in addition to his salary, "for the purposes of his office". (C. 137. In effect, June 13, 1912).

United States.—The officer or other person appointed to inspect contract work for the government must report to the proper officer all violations of the eight-hour law, and the amount of the penalties

due for such violations must be withheld by the person who is in charge of paying out money on the contract. Contractors and sub-contractors have the right of appeal within six months to the head of the department making the contract, and may appeal further from the decision of the head of the department to the Court of Claims. (C. 174. In effect, January 1, 1913).

CHILD LABOR

Out of thirteen state legislatures in which child labor bills were introduced during 1912, ten enacted legislation of some kind on the subject. Arizona and Maryland enacted most of the provisions of the uniform child labor law, and Minnesota, by adding many features to previous legislation, brought her law nearly to the standard of the uniform law. Though Louisiana took a backward step in readmitting her children to the stage, the general tendency is distinctly toward the raising and extension to new occupations of the minimum age limit, toward the shortening of hours, and toward the prohibition of night work for children.

Arizona.—Fourteen years is the age limit; no younger child may be “employed, permitted or suffered” to work; and the list of occupations covers mills, factories, workshops, mercantile establishments, tenement-house manufactories and workshops, stores, business offices, telegraph and telephone offices, restaurants, bakeries, barber shops, apartment houses, bootblack stands, and the distribution and transportation of merchandise and messages. Children under sixteen are excluded from a long list, similar to that in the New York law and in the new Maryland law described later, and the state board of health is given the power to declare any trade or occupation dangerous to the lives or limbs, or injurious to the health or morals of minors under sixteen, and to prohibit their employment in such trades or occupations. The same power is given the board of health with reference to excluding children under eighteen from extra-hazardous occupations, the list of which, as given in the law, is very similar to that of the Maryland act. Sixteen is the minimum age for mines and quarries; smelters and ore reduction works are mentioned in both lists. The minimum age for street trades in cities of the first and second classes is ten for boys and sixteen for girls.

Employment certificates for children under sixteen and lists of all such children must be kept on file in all establishments for which fourteen is the minimum age. These certificates are issued, in a carefully prescribed form, by the county, city, or town superintendent of schools or, if there is no such officer, by a person authorized by the school board, provided the child is not to enter that person's own employment or the employment of a firm or

corporation of which he is a member, officer, or employee. Before certificates are issued a prescribed form of school record of the child, and a passport or transcript of the birth or baptism record or the affidavit of the parent or guardian showing the place and date of birth must be furnished; and the child must appear personally, must prove that he can read and legibly write simple sentences in English, and must prove to the satisfaction of a medical officer or of a physician appointed by the school committee that he has attained normal development and is in sufficiently sound health and physically able to perform the stated work. Only children who have satisfied certain requirements, both as to attendance and as to attainments, are entitled to school records. The names both of children who have been granted and of children who have been refused employment certificates, together with the name of the employer and the nature of the occupation for which each certificate has been issued, must be sent monthly to the state superintendent of public instruction. Inspectors and school attendance officers are directed to demand, and employers must furnish, for all children who may appear to be under sixteen, satisfactory evidence that they are in fact over that age.

Hours of labor are carefully regulated. In incorporated cities and towns night work, from 10 p. m. to 5 a. m., is forbidden for messengers of telegraph or messenger companies who are under the age of twenty-one. Boys under sixteen and girls under eighteen may not work at any gainful occupation, except domestic service or farm labor, more than eight hours a day or forty-eight hours a week, or between 7 p. m. and 7 a. m. Printed notices, stating the hours required, the hours of beginning and ending work, and the meal times, must be posted in all rooms where boys or girls of these ages are employed.

The mere presence of a child in any establishment is *prima facie* evidence of its employment; employment for any other time than as stated in the printed notice is a violation of the act; and failure to produce an employment certificate or evidence of the age of a child over sixteen, when demanded by the proper authorities, is *prima facie* evidence of illegal employment. The penalties for violations of various sections of the act range from a minimum of \$5 to a maximum of \$200. (C. 32. In effect, May 13, 1912). (See also "Administration of Labor Laws", p. 447).

Under the above law no child under fourteen, instead of as before no child under fourteen who has not been excused from attendance, may be employed during school hours in any occupation. But the new compulsory education law further requires that no child under sixteen may be employed during school hours without a written permit from the board of trustees. The reasons for which permits may be granted are practically the same as those for which children might be excused from attendance under the act of 1907, and the penalties are unchanged. (C. 77, sec. 89. In effect, May 20, 1912). Boys under eighteen may not be employed as hoisting engineers or underground in mines (C. 33. In effect, May 13, 1912), or as telegraph or telephone operators receiving or transmitting messages governing the movement of trains. (C. 8. In effect, April 22, 1912).

Kentucky.—No female under twenty-one may be "employed or suffered or permitted" to work at any gainful occupation (except domestic service and nursing) for more than ten hours in any one day or sixty hours in a week. (C. 77. In effect, June 10, 1912). (See also "Woman's Work", p. 495).

Louisiana.—No child under sixteen may be employed in any theatrical exhibition or as a musician in any concert unless a permit has first been obtained from the judge of a juvenile court. A non-resident child must be accompanied by parent or guardian and satisfactory proof must be given that the child is receiving proper instruction and training in common-school studies. The employer must furnish bond not exceeding \$2,000. (Act No. 184).

No child under seventeen years of age may enter or be employed in any place where billiards or pool games are played. Penalty, \$25 to \$100, or imprisonment for three months, or both. (Act No. 25. In effect, June 25, 1912).

Maryland.—The age limit is raised from twelve to fourteen years in most occupations, but remains twelve for work in canning and packing establishments, stores, offices, boarding houses, places of amusement and clubs, and in the distribution, transmission and sale of merchandise, except that children under fourteen may not work "in any business or service whatever" during school hours unless they have fulfilled during the current year the legal requirements as to school attendance. It is provided, not merely as before that no child shall be employed, but that no child shall be "permitted or suffered to work."

Children under sixteen are forbidden to work in a long list of dangerous and unhealthful occupations. They may not operate or assist in operating some thirty types of machinery; they may not work on railroads or vessels, in tunnels, mines (age limit raised from twelve years or if illiterate, fourteen years), coal breakers, etc., in assorting, manufacturing or packing tobacco, in connection with processes in which dangerous or poisonous acids are used, or in any other occupation dangerous to their lives and limbs or injurious to their health or morals. Children under sixteen may not be employed in theaters or concert halls except on permits issued, for a period not exceeding two weeks, by the chief of the Maryland bureau of statistics and information. It is further provided that children under eighteen shall not work in certain other dangerous or harmful occupations, as in connection with blast furnaces, docks or wharves, in running elevators, in oiling or cleaning machinery in motion, in operating emery wheels, in or about establishments where nitroglycerine or other explosives are manufactured, or in distilleries, breweries, theaters, concert halls or other places where intoxicating liquors are made or sold (former age limit for breweries, etc., sixteen years), and no female under eighteen may work at an employment which compels her to stand constantly. No minor under twenty-one may work in or about a saloon or bar-room.

In cities of 20,000 population or over, the night work of messenger boys under eighteen years is forbidden between 10 p. m. and 6 a. m.; newsboys, except when delivering papers on regular routes out of school hours, must be at least twelve years old, and newsgirls must be sixteen; and for any other street trade or occupation, such as that of bootblack or distributing handbills (except newspapers, magazines or periodicals), a boy must be fourteen and a girl sixteen, and work is forbidden between 8 p. m. and 6 a. m. unless an employment certificate has been granted.

The new provisions for enforcement are much more elaborate than the old. Lists of all boys under sixteen and girls under eighteen must be posted, and inspectors are directed to require that all employment certificates be produced. The duty of issuing certificates in the counties is transferred from the health officers and boards of health to the superintendents of schools. It is provided that there shall be two classes of certificates, general employ-

ment certificates and vacation employment certificates. For the first the parent, guardian, or legal custodian of the child must apply in person and present (1) the child's school record, (2) a certificate from a physician appointed by the officer who is to issue the certificate stating that the child is normally developed and physically able to perform the work for which the permit is desired, and (3) one of four specified proofs of age. The child also must appear in person and prove that he or she is able to read and write simple sentences in English. For a vacation employment certificate the child must appear in person and produce evidence of age and a physician's statement. Employment certificates must contain the name and address of the prospective employer and the nature of the occupation in which the child is to be engaged, and are good only for the one employer and for the one occupation. On termination of the employment they are returned, not to the children as before, but to the issuing authorities, and a new physician's certificate of fitness must be issued before a child can obtain an employment certificate for a new occupation. If an inspector finds a child apparently under sixteen at work without a certificate he may require the employer to produce evidence of age or cease to employ the child, upon pain of prosecution for illegal employment.

In cities of 20,000 population or over, no boy under sixteen may engage in any street trade without a permit and badge good for one year, which are issued only on presentation of his school record and of evidence as to his age. Badges are non-transferable and must be worn when at work; their color is changed annually; and they do not entitle a child to work after 8 p. m. or before 6 a. m. or during school hours unless the child has also an employment certificate. Permits may be revoked and badges taken from children who violate any of the provisions of the act, become delinquent, or fail to comply with the school attendance law.

Violations of the act, instead of being reported to the justice of the peace as before, are reported weekly to the officers who issue employment certificates and also to the school authorities. Penalty for employer or for parent or guardian, for the first offense not more than \$50; for the second offense not more than \$200, or imprisonment for not more than thirty days, or both. A number of other penalties, ranging from \$50 to \$200, with imprisonment in some cases, are provided for violations of special sections of the act.

(C. 731. In effect, December 1, 1912). (See also "Administration of Labor Laws", p. 447).

Massachusetts.—The minimum wage commission may inquire into the wages paid to minors in occupations in which they constitute the majority of employees and, after giving public hearings, may determine minimum wages for such minors. In this case no wage board is appointed, but otherwise the procedure is the same as in the determination of minimum wages for women. Employers must keep a register of the names and addresses of all minor employees. (C. 706. In effect, July 1, 1913). (See also "Woman's Work", p. 497). The law requiring that seats be provided for women is extended to children; the provisions for the use of such seats are strengthened; and it is further enacted that, except when the work cannot properly be performed in a sitting position, seats shall be provided and women and children shall be permitted to use them while at work as well as when not actively employed. (C. 96. In effect, March 15, 1912). The act of 1911 limiting the hours of children under eighteen and of women in manufacturing and mercantile establishments to fifty-four a week is strengthened by requiring that if any woman or child be employed in more than one such establishment the total number of hours shall not exceed fifty-four a week. (C. 477. In effect, May 12, 1912). The act of 1911 limiting the hours of children and women garment workers in workshops connected with mercantile establishments to fifty-six a week is amended, omitting workshops for the making of garments. (C. 452. In effect, April 7, 1912).

Minnesota.—The child labor law is extended to employment in the construction of buildings or about engineering works. To obtain an employment certificate a child must now have a physician's certificate of physical fitness for the work, and the educational requirements are materially raised by the provision that the child must have completed the studies taught in the common schools of the district or in a parochial or private school of equal grade. Reports of officers entitled to issue certificates, to the commissioner of labor, must be more detailed than formerly. Night work, from 7 p. m. to 7 a. m., is forbidden. A minimum penalty of \$25 is provided for violation of the minimum age sections or the section relating to hours of labor. Children under sixteen may appear in concerts or theatrical exhibitions (except as prohibited by R. L.

1905, sec. 4939) only with the written consent of the mayor of the city. Notice of application for such consent must be given in writing at least forty-eight hours in advance, to the commissioner of labor and to the secretary of the Minnesota child labor committee; a hearing must be had if requested; the consent must specify the place of the exhibition, and the nature, duration and number of performances; and it may be revoked at any time. Night work, between 9 p. m. and 5 a. m., is forbidden for messenger boys under eighteen, and no girl under twenty-one may at any time be employed as a messenger by a telegraph, telephone or messenger company. The provision in regard to physician's certificates for children who appear unable to perform their work is strengthened by requiring that the officials of the labor department or truant officers not only may but "shall" require the employer, not as before to produce, but to "procure" such a certificate, not as before from any reputable practising physician, but from a physician "designated by the school board". (Special Session, 1912, C. 8. In effect, June 19, 1912).

Mississippi.—The child labor law is extended to canneries, except fruit canneries; the minimum age for girls is raised from twelve to fourteen years; and the age under which their hours are limited is raised from sixteen to eighteen. The minimum age and the age under which hours are regulated remain as before for boys, but the maximum number of hours for both boys and girls is decreased from ten to eight a day and from fifty-eight to forty-eight a week. (C. 165. In effect, March 16, 1912).

New Jersey.—The minimum age for night work, from 7 p. m. to 7 a. m., in certain establishments is lowered from eighteen to sixteen, but the provisions of the act are extended to cover places where candy, ice cream or frozen sweets, and macaroni and other foodstuffs, as well as biscuits, pies, bread, crackers, cakes, and confectionery, are made for sale. (C. 127. In effect, March 21, 1912). (See also "Hours of Labor", p. 479).

New York.—The hours of labor of boys under eighteen and of girls under twenty-one in factories are reduced from ten to nine a day and from sixty to fifty-four a week. Both boys and girls over sixteen may be employed more than nine hours a day, regularly for not more than five days a week in order to make a short day or holiday on one of the six days of the week or irregularly for not

more than three days a week, provided they are not required or permitted to work over ten hours a day, instead of twelve as before, and not over fifty-four hours a week, instead of sixty as before. It is specifically provided that the sections limiting hours of labor shall not apply to the employment of minors sixteen years of age and over in canning or preserving perishable products between June 15 and October 15 of each year. (C. 539. In effect, October 1, 1912). Before an employment certificate is issued the physical fitness of the child for the work which it intends to do must be determined in every case, instead of only in doubtful cases as before, by a medical officer of the department or board of health, who must make a thorough physical examination and record the result on a blank furnished by the commissioner of labor, giving all facts required by the commissioner. Duplicates of these records must be sent monthly to the commissioner of labor. (C. 333. In effect, April 15, 1912). No child under the age of eighteen, even if a member of the family of the proprietor of the place, and no girl or woman, not a member of his family, may be permitted to sell or serve liquor. (C. 264. In effect, April 11, 1912).

Rhode Island.—Night work, from 10 p. m. to 5 a. m., is forbidden for messengers under twenty-one years of age. Penalty for anyone who "shall employ, suffer or permit" a minor to work at night as a messenger, \$20 to \$50 for the first offense, and for a second offense, \$50 to \$100, or imprisonment for from ten days to six months, or both. (C. 814. In effect, September 1, 1912).

South Carolina.—In cities of 5,000 population or over children under fourteen may not be "employed, permitted or suffered to work" as messengers for telegraph, telephone or messenger companies, and night work, from 10 p. m. to 5 a. m., is forbidden for messengers under eighteen. Penalty for employer or parent or guardian, from \$10 to \$50, or imprisonment for not longer than thirty days. (No. 405. In effect, July 1, 1912). (See also "Administration of Labor Laws", p. 453).

Virginia.—No boy under fourteen and no female may be permitted to work in a coal mine, and in doubtful cases the parents or guardians of a boy must furnish affidavits of age. Penalty for operators, agents or foremen who knowingly violate the law, or for any person who knowingly makes a false statement of age, from \$10 to \$500, or imprisonment for from ten to ninety days. (C.

178, sec. 15. In effect, June 13, 1912). The ten-hour law for factories and manufacturing establishments where children under fourteen are employed is extended to cover workshops and mercantile establishments, but exceptions are made of establishments engaged exclusively in packing fruits and vegetables from July 1 to November 1, of mercantile establishments in towns of less than 2,000 inhabitants, and of mercantile establishments on Saturdays. (C. 248. In effect, June 13, 1912).

United States.—The Children's Bureau is directed to investigate especially, among other questions, the employment of children, their accidents and diseases, dangerous occupations, and all state and territorial legislation affecting children. The force authorized for the bureau consists of fifteen persons, including the chief, assistant chief, and statistical expert. (C. 73. In effect, April 9, 1912). Appropriation, \$25,640. (C. 350. In effect, August 23, 1912).

COMMISSION ON INDUSTRIAL RELATIONS

United States.—A Commission on Industrial Relations is created, composed of nine persons, including at least three employers and three representatives of organized labor. The members are appointed by the President and are paid traveling and other necessary expenses and \$10 a day while actually engaged in the work. The commission is authorized to hold sittings and public hearings anywhere in the United States, to administer oaths, summon and compel the attendance of witnesses, and compel testimony. Secretaries, experts, stenographers and other assistants may be employed, offices may be rented, books and other supplies may be bought, binding may be done, and members or employees may travel in or outside the United States on the business of the commission. Experts may be paid not to exceed \$5,000 a year, but no other person, except stenographers temporarily employed to take testimony, may be paid at a rate over \$3,000 a year. The term of the commission is three years and at least one report must be made to Congress within the first year, one within the second year, and a final report not later than three years after the approval of the act. The Department of Commerce and Labor is authorized to cooperate with the commission in any manner and to whatever extent the Secretary of Commerce and Labor may approve.

Its duties are as follows: "The commission shall inquire into the general condition of labor in the principal industries of the United States including agriculture, and especially in those which are carried on in corporate forms; into existing relations between employers and employees; into the effect of industrial conditions on public welfare and into the rights and powers of the community to deal therewith; into the conditions of sanitation and safety of employees and the provisions for protecting the life, limb, and health of the employees; into the growth of associations of employers and of wage-earners and the effect of such associations upon the relations between employers and employees; into the extent and results of methods of collective bargaining; into any methods which have been tried in any state or in foreign countries for maintaining mutually satisfactory relations between employees and employers; into methods for avoiding or adjusting labor disputes through peaceful and conciliatory mediation and negotiations; into the scope,

methods, and resources of existing bureaus of labor and into possible ways of increasing their usefulness; into the question of smuggling or other illegal entry of Asiatics into the United States or its insular possessions, and of the methods by which such Asiatics have gained and are gaining such admission, and shall report to Congress as speedily as possible with such recommendations as said commission may think proper to prevent such smuggling and illegal entry. The commission shall seek to discover the underlying causes of dissatisfaction in the industrial situation and report its conclusions thereon." Appropriation for the fiscal year ending June 30, 1913, \$100,000. (C. 351. In effect, August 23, 1912).

EMPLOYERS' LIABILITY, WORKMEN'S COMPENSATION, AND INSURANCE

The legislation of 1912 upon the subject of employers' liability and workmen's compensation may be most conveniently divided into general liability laws, compensation acts and amendments, and acts regulating employers' liability insurance companies. Statutes were enacted in Arizona, Maryland, Michigan, and Rhode Island. Of these the act of Maryland is purely voluntary; those of Michigan and Rhode Island are elective, with the well-known provision for bringing pressure to bear upon the employer by cutting off his defenses in case of non-election; while that of Arizona professes to be a workmen's compulsory compensation law. The bill drawn up in accordance with the recommendations of the federal commission failed of passage in Congress.

The Massachusetts compensation act of 1911 was changed in many minor details; the federal act was extended to employees of the Bureau of Mines, the Forestry Service, and the Lighthouse Service; and the New York legislature provided by resolution for an amendment to the constitution allowing the passage of a compulsory compensation act. Among the other laws relating to compensation should be noted especially the California act providing for an investigation by the industrial accident board of the causes and methods of preventing accidents, as well as of the various forms of liability insurance and workmen's compensation.

A. GENERAL LIABILITY LAWS.

Arizona.—In accordance with the provision of the constitution an employers' liability law is enacted to protect the safety of employees in hazardous occupations. The list of occupations declared to be especially dangerous, by reason of inherent risks and hazards which are unavoidable by the workmen, includes substantially all railroad and street railway work; all work necessitating dangerous proximity to any explosive or to compressed air; iron or steel bridge building; the running of elevators and of derricks or other hoisting apparatus; work on ladders or scaffolds more than twenty feet above the ground or the floor beneath; electrical work; work in mines, quarries, open pits or cuts, ore-reduction works and smelters;

the construction and repair of tunnels, subways and viaducts; and all work in places where steam, electricity, or any other mechanical power is used to operate machinery. Employers must inform employees in such occupations, by rules, regulations or instructions, "as to the duties and restrictions of their employment", to the end of protecting their safety. In case of accident not caused by the negligence of the employee the employer is liable in damages, the questions of contributory negligence and assumption of risk being left to the jury as questions of fact. Contracting out is not permitted. If the employer appeals from the decision of a lower court and the judgment for the employee is sustained, the employer must not only pay the damages but must pay interest at the rate of twelve per cent per annum on the amount of the judgment from the date when the suit was first filed until the full amount is paid. Action must be begun within two years. (C. 89. In effect, May 24, 1912).

Railroads are forbidden to establish, maintain, or assist relief associations which require employees becoming members to enter into any contract or agreement, directly or indirectly, whereby they waive their right to damages in case of injury or death, and all such contracts are declared null and void. (C. 13. In effect, May 2, 1912). Employees of corporations are forbidden to obtain or attempt to obtain damages by false statements as to the nature or extent of an injury. Penalty for a corporation, from \$100 to \$5,000, and for an officer, agent, or employee, not exceeding \$1,000, or imprisonment for not more than one year, or both, for each offense. (C. 90, secs. 23, 76-79. In effect, May 28, 1912).

Massachusetts.—The provisions relating to notification of accidents before bringing actions for damages are modified so that, as in the case of claims before the industrial accident board, practically any form of written, signed communication giving the time, place, and cause of the injury or death is sufficient. (C. 251. In effect, March 14, 1912). The maximum amount which may be recovered in case of the death of an employee of a railroad corporation is raised from \$5,000 to \$10,000. (C. 354. In effect, May 1, 1912). Railroad companies are authorized to issue non-transferable passes to former employees who have been injured in their service. (C. 488. In effect, April 13, 1912).

Mississippi.—The law providing that proof of injury is evidence

of want of care on the part of railroad companies is extended to all other companies which use engines, locomotives or cars propelled by steam, electricity, gas, gasoline or lever power and running on tracks, and the company is declared directly responsible. (C. 215. In effect, March 6, 1912).

New Jersey.—Actions begun by an executor or administrator, as well as other actions resulting from injuries caused by neglect, default or wrongful act of a railroad company, must be brought within two years after the death of the injured person. (C. 175. In effect, March 27, 1912).

Virginia.—Railroad corporations, by an amendment to the liability act, are made liable in damages for injuries resulting from acts of a coemployee, not only on another but also on the same train, and on or about an engine, even if the party injured had the right to direct the services of the coemployee. The provisions of the act are restricted in their application so as not to conflict with any provisions of the constitution or laws of the United States. (C. 291. In effect, June 13, 1912).

B. COMPENSATION ACTS AND AMENDMENTS.¹

Arizona.—The Arizona law was enacted in obedience to a mandate of the constitution of that new state. The constitution requires, in substance, that the legislature enact a compulsory compensation law applicable to workmen engaged in manual or mechanical labor in especially hazardous employments, to compensate them for accidents arising out of and in course of the employment and due to a necessary or inherent risk thereof or to a failure of the employer to exercise due care or to comply with the laws; it leaves it optional with the employee, however, either to settle for such compensation or to retain his right to sue the employer as provided by the constitution. The constitution further directs the legislature to enact an employers' liability law for all cases in which death or injury is not caused by the negligence of the employee himself, and it further abrogates the fellow-servant doctrine and provides that the defenses of contributory negligence or of assumption of risk shall be left as questions of fact to the jury. It thus appears that under the constitution the employer is exposed, at the

¹For the criticism of the four new compensation acts the Association for Labor Legislation is indebted to Prof. Ernst Freund of the Law College of the University of Chicago.

option of the employee, either to the liability to pay compensation or to an employers' liability for damages of the severest type. On examining the act, however, we find that it provides, in section 14, that "if after the accident the employer or the workman shall refuse to make or accept compensation under this act, or to proceed under or rely upon the provisions hereof for relief, then the other may pursue his remedy or make his defense under any existing statutes, the state constitution, or the common law, except as herein provided, as his rights may at the time exist". This peculiar proviso seems to leave it as optional with the employer as with the employee to stand upon his common-law rights, and one wonders how such a law can be called a compulsory compensation law and how it can be accepted as a compliance with the constitution. Perhaps the supreme court of the state will find some way out of the difficulty. (Special Session, C. 14. In effect, June 8, 1912).

California.—The industrial accident board is directed to collect and compile statistics in regard to industrial accidents and their probable causes, and to investigate methods and devices for their prevention and the comparative merits and relative cost of the various forms of liability insurance and workmen's compensation. Employers and liability insurance companies must furnish the board, on written request, with any information in their possession or under their control. But the board and its employees are forbidden to divulge any such information without written consent, under penalty of from \$10 to \$100, or imprisonment for not more than thirty days, or both; and no such information may be used, without written consent, in any action against an employer or a liability insurance company. The board is directed to report the results of its investigations during 1912 to the governor not later than February 1, 1913, and is authorized to publish, whenever and however it deems best, all the results of its investigations and any other information which it considers essential for full acquaintance with the purpose and operation of the law. Members of the board and examiners appointed by it are empowered to enter places of business during reasonable business hours for the purpose of making these investigations. Maximum penalty for employers or companies, \$10. Appropriation, from funds already appropriated for the board, \$15,000. (C. 39. In effect, March 2, 1912).

Maryland.—The act of Maryland may be disposed of in a few

words. It is almost a literal copy of the bill which was introduced in Illinois in 1907 but failed to become a law. The act is purely permissive, making it lawful for employer and employee to agree upon a scheme of compensation, the details of which are laid down in the act, whereupon the employer becomes relieved of the common-law liability for injuries. A voluntary law of this type does not satisfy present-day demands. The experience of Massachusetts and New York, where such laws have been on the statute books for several years, goes to show that it may be expected to remain a dead letter. (C. 837. In effect, April 15, 1912). The law of 1910 in regard to the miners' and operators' cooperative relief fund of Allegany and Garrett counties is amended so as to increase the tax upon operators and employees in Garrett county from twenty-seven to thirty-eight cents a month, leaving the tax in Allegany county twenty-seven cents a month as before. (C. 445. In effect, April 8, 1912).

Massachusetts.—The workmen's compensation act of 1911 is amended in many details. The provisions relating to injuries for which extra compensation must be paid are slightly changed. Employers are given the right to defend claims for double compensation on account of their own misconduct and to demand examination of the injured person. Slight changes are made in the provisions in regard to the notification of injuries, the form of claims, the time limit for making claims, and the duties of arbitration committees. The sections relating to the review of claims and appeals are changed so as to allow appeals to the superior court of the county. Employers who cease to be subscribers to the employees' insurance association must notify their employees in writing or in print on or before the day on which their policies expire, and copies of such notices must be filed with the industrial accident board. The provisions in regard to insurance in private liability insurance companies are somewhat strengthened. The number of members of the industrial accident board is increased from three to five; and their terms of office are reduced from six to five years. The salaries of the members are also reduced. The fees of witnesses are regulated; and the superior court is given power to enforce the attendance and testimony of witnesses and the examination of books and records. (Cs. 172 and 571. The sections which relate to the appointment and powers over witnesses of the industrial accident board are in effect,

May 10, 1912, and the other sections are in effect as in the original law, those relating to the employees' insurance association on January 1, 1912, and the remainder on July 1, 1912).

It is provided that the insurance commissioner may withdraw his approval, previously given, of premiums or rates of the employees' insurance association or of an insurance company. (C. 666. In effect, May 28, 1912).

Michigan and Rhode Island.—The acts of Michigan and Rhode Island are of the type with which the legislation of 1911 has made us familiar. They cover all employments with specified exceptions; Michigan excepts household, domestic and farm labor, and Rhode Island excepts domestic and agricultural labor and all employers having not more than five employees. Michigan includes the state and its subdivisions, and expressly extends protection to aliens; Rhode Island confines the application of its law to employees receiving not more than \$1,800 a year. In view of existing and contemplated federal legislation the act of Michigan provides that it shall apply to employees and workmen in interstate or foreign commerce for whom a rule of liability or method of compensation has been or may be established by Congress only to the extent that their mutual connection with intrastate work may and shall be clearly separable and distinguishable from interstate or foreign commerce. Both acts speak of injuries arising out of and in the course of employment, following the phraseology of the English law which has resulted in a judicial construction tending to limit the operation of the act to risks inherent in the nature of the business. In accordance with the prevailing custom, injuries resulting in disability lasting less than two weeks do not entitle to compensation, and in case of other injuries compensation, unless—in Michigan—the disability continues for eight weeks or longer, is paid only from the fifteenth day, subject to the usual provisions, however, for the payment of medical and hospital expenses.

The compensation is measured by the average earnings, being at the rate of one-half of the loss within a stated minimum and maximum sum per week and being also limited by a maximum number of weeks and by a maximum aggregate figure. Both Rhode Island and Michigan fix the measure of disability for a number of specified injuries. The compensation is paid in periodical instalments with the possibility of commutation for a lump sum under the direction

of the competent authority (court or board). The employee is required to submit to medical examination, and the rate of compensation is liable to be revised from time to time. For the settlement of controversies Michigan provides, in case of failure to reach an agreement, a compulsory arbitration subject to review by an accident board which the act creates. The decision of that board is to be conclusive as to the facts and only questions of law can be carried to the supreme court. Rhode Island allows a petition of equity to a court, with a summary hearing. Thus neither state deems it necessary to observe the guaranty of a jury trial.

To insure payment of compensation by the employer Michigan adopts a plan for which no precise parallel can be found in any other act. At the time of accepting the law the employer is required to choose one of four methods: (1) if of sufficient financial ability, he may assume an individual liability; (2) he may choose insurance with an employers' liability company authorized to take risks in the state; (3) he may choose insurance in any employers' insurance association organized under the laws of the state; (4) he may choose insurance in a state accident fund established upon petition of five or more employers employing an aggregate number of not less than three thousand employees and managed by the state insurance commissioner somewhat upon the principle of the German employers' insurance associations. It will be interesting to watch the operation of this phase of the Michigan law.

Rhode Island permits the substitution, for the compensation provisions of the act, of voluntary alternative schemes subject to the approval of the superior court, upon condition that such schemes provide benefits as great as those provided by the act and that, if contributions are asked of employees, additional benefits shall be granted at least equivalent to these contributions. The scheme must also provide for final equitable distribution of such contributions. (Michigan: First Extra Session, 1912, No. 10. In effect, September 1, 1912). (Rhode Island: C. 831. In effect, October 1, 1912).

New Jersey.—Copies of orders made by judges upon matters that arise under the employers' liability and workmen's compensation act must be filed with the commissioner of labor. (C. 316. In effect, April 1, 1912). The prevailing party in actions under the employers' liability act is entitled to costs, and the amount and method of obtaining such costs are regulated. (C. 356. In effect, April 1, 1912).

New York.—An amendment to the constitution allowing the passage of a compensation act is proposed by concurrent resolution and is to be referred to the next legislature in accordance with the provisions of the constitution relative to amendments. The resolution reads as follows:

"Nothing contained in this constitution shall be construed to limit the power of the legislature to enact laws for the protection of the lives, health, or safety of employees; or for the payment, either by employers, or by employers and employees or otherwise, either directly or through a state or other system of insurance or otherwise, of compensation for injuries to employees or for death of employees resulting from such injuries without regard to fault as a cause thereof, except where the injury is occasioned by the wilful intention of the injured employee to bring about the injury or death of himself or of another, or where the injury results solely from the intoxication of the injured employee while on duty; or for the adjustment, determination and settlement, with or without trial by jury, of issues which may arise under such legislation; or to provide that the right of such compensation, and the remedy therefor shall be exclusive of all other rights and remedies for injuries to employees or for death resulting from such injuries; or to provide that the amount of such compensation for death shall not exceed a fixed or determinable sum; provided that all moneys paid by an employer to his employees or their legal representatives, by reason of the enactment of any of the laws herein authorized, shall be held to be a proper charge in the cost of operating the business of the employer." (C. R., p. 1382).

The charter of Greater New York is amended to allow a day laborer who has been injured in the performance of his duties a leave of absence with pay during disability. The leave may not be for more than thirty days except with the consent of the mayor and the comptroller. (C. 353. In effect, April 15, 1912).

Rhode Island.—See under Michigan, p. 472.

United States.—The provisions of the workmen's compensation act of 1908 are extended to artisans, laborers, and other employees who are engaged in hazardous work under the Bureau of Mines and the Forestry Service (C. 57. In effect, March 11, 1912), or in the Lighthouse Service (C. 255. In effect, July 27, 1912). The President is authorized to provide a new method for the determination and adjustment of personal injury claims made by employees of the Panama Canal or of the Panama Railroad, and to prescribe a schedule of compensation for injuries to such employees. Claims must be paid out of funds hereafter appropriated for that purpose or out of the funds of the Panama Railroad Company, when that company is responsible for the injury. (C. 390. In effect, August 24, 1912).

C. EMPLOYERS' LIABILITY INSURANCE COMPANIES.

Illinois.—The law regulating mutual insurance companies for the purpose of furnishing insurance against loss from accidents to employees is amended, and it is provided that no insurance business of this kind may be transacted by other than a legally incorporated company, except by permission of the insurance superintendent. It is no longer necessary that the members of such mutual insurance companies shall be engaged in the same class of manufacturing or mining. (Second Special Session, H. B. 22, p. 48. In effect, July 1, 1912).

Massachusetts.—Mutual insurance companies which were transacting employers' liability business before April 6, 1911, if authorized by a two-thirds vote of the policy holders present at a meeting called for the purpose, may exercise the same rights and powers as companies organized under the act of 1911. (C. 311. In effect, March 22, 1912).

Michigan.—The formation of mutual insurance companies by employers who have elected to come under the employers' liability and workmen's compensation law is authorized, subject to the approval of the industrial accident board. The board may, in its discretion, limit the membership of a company to employers engaged in industries of the same general character or in which the risks are similar in nature and extent. The formation and management of such companies is regulated in detail, and it is specially provided that the board of direction of a company may make and enforce reasonable rules and regulations for the prevention of injuries on the premises of its members. Members who neglect to provide suitable safety appliances as provided by law or as required by the board of directors may be expelled, but they have the right of appeal to the industrial accident board. (First Extra Session, 1912, No. 12. In effect, June 18, 1912).

Virginia.—An act providing for a reserve for outstanding liability losses of employers' liability insurance companies requires such companies to include in their annual statements detailed information in regard to premiums, payments on account of injuries, number of suits being defended, and half a dozen other items calculated to show the results of their experience in the business. (C. 65. In effect, June 13, 1912).

HOURS OF LABOR

A. PUBLIC EMPLOYMENT.

Congress has established the eight-hour day for contract work done for the United States (with certain exceptions) and for letter carriers and post-office clerks in the larger cities. Though this legislation does not apply to work on the Panama Canal, the law, together with the Arizona eight-hour act and the Massachusetts law providing Saturday half holidays in summer for certain public employees, means a distinct advance in the fight for recognition of the right to leisure.

Arizona.—Eight hours constitute a lawful day's work for all laborers, mechanics and other persons employed by the state or any of its political subdivisions, except in cases of extraordinary emergency in time of war, or when longer hours are necessary for the protection of property or human life. In such cases payment shall be on the basis of eight hours as a day's work. The act applies to all contract work for the state or its political subdivisions, as well as to direct employees, and no contractor may "require or permit" laborers to work more than eight hours. Existing contracts are exempt. Penalty, from \$50 to \$1,000, or imprisonment for not more than six months, or both. (C. 78. In effect, May 18, 1912).

Massachusetts.—Weekly half holidays during June, July, August, and September must be given without loss of pay to laborers and mechanics in the permanent service of the metropolitan water and sewerage board and the metropolitan park commission (with certain exceptions). If practicable, the half holiday must be on Saturday. But if the public service requires, enough days off duty may be given at any time during the year to equal in time these weekly half holidays. (C. 528. In effect, April 22, 1912).

United States.—An eight-hour provision must be inserted in all contracts which involve the employment of labor made by or on behalf of the United States, any territory or the District of Columbia. Laborers and mechanics, whether in the employ of a contractor or a sub-contractor, may not be "required or permitted" to work over eight hours in a calendar day. Penalty, \$5 for each laborer or mechanic and for every calendar day. It is specifically provided that the act shall not apply to contracts for transportation by land or

water, or for the transmission of intelligence, or for the purchase of supplies, or for materials and articles that can usually be bought in open market, except armor and armor plate, or to the construction or repair of levees or other works necessary for protection against floods and overflows. Under certain extraordinary conditions and in certain emergencies the President may declare a violation of the eight-hour clause in a contract to have been excusable, and in such cases no penalties may be imposed. In time of war or when war is imminent, the President, by executive order, may waive the provisions of the act as to any specific contract, and he may waive them as to any Panama Canal contract until January 1, 1915. (C. 174. In effect, January 1, 1913).

An eight-hour day is provided for letter carriers in the city delivery service and for clerks in first and second class post offices. The eight hours of service may not extend over a longer period than ten consecutive hours. In cases of emergency longer hours are allowed, but extra compensation, in proportion to salaries, must be paid. For all Sunday work compensatory time must be allowed within the next week. Post offices of the first and second classes, however, are no longer open on Sunday for delivering mail to the general public, except special delivery letters. (C. 389. The Sunday closing section is in effect, August 24, 1912, and the eight-hour section, March 4, 1913). The appropriation for the armament of fortifications may not be used to purchase goods from any person, firm, or corporation which has not established an eight-hour work-day. (C. 157. In effect, July 6, 1912). The naval appropriation act specifically provides that the eight-hour law shall apply to all contracts which it authorizes. (C. 335. In effect, August 22, 1912).

B. PRIVATE EMPLOYMENT.

Five states, Arizona, New Jersey, New Mexico, Massachusetts, and Mississippi, enacted during 1912 laws regulating the hours of labor of men in private employments. Arizona passed an eight-hour law for mines and smelters and similar establishments. New Jersey, in revising her legislation relating to bakeries, limited the hours of all employees to ten a day and sixty a week, but provided that if any part of the act was overthrown in the courts it should not affect other parts. Massachusetts strengthened and extended previous legislation concerning the hours of work of conductors and

motormen; New Mexico regulated the hours of railroad employees; and Mississippi passed a sweeping ten-hour law.

Arizona.—The following occupations are declared to be injurious to health and dangerous to life and limb, and the hours of labor in them are therefore limited to eight a day, including the time going from and returning to the surface: employment in underground mines, underground workings (the eight-hour day in underground mines and workings has been on the statute books since 1903), open-cut workings, open-pit workings, in the operation of smelters, reduction works, stamp mills, concentrating mills, chlorination processes, cyanide processes, cement works, rolling mills, rod mills, coke ovens and blast furnaces. It is provided that in case of emergency where life or property is in imminent danger, the period may be prolonged. Penalty for anyone who as a superior officer shall "command, persuade or allow" a violation, from \$250 to \$500, or imprisonment for from three to six months. The jury decides whether the punishment shall be by fine or imprisonment. (C. 28. In effect, May 11, 1912). An amendment passed at the special session adds a proviso allowing a change of shifts once in two weeks. (Special Session, C. 26. In effect, June 15, 1912). On the same ground an eight-hour day is provided for employees of electric light and power plants. Maximum penalty, \$100. Each day's violation is a separate offense. (C. 50. In effect, August 16, 1912). (See also "Administration of Labor Laws", p. 446).

Massachusetts.—The law regulating the hours of work of conductors and motormen is extended to include trainmen; the clause limiting the act to employees of street railway companies is omitted; and it is provided that a day's work "shall be arranged by the employer upon the basis of nine hours' platform work", instead of "shall not exceed ten hours". But in case the schedule cannot be arranged to furnish a day's work of approximately nine hours it may be arranged for not to exceed nine and a half hours, the platform time above nine hours to be paid for as overtime. The work of men on regular cars must as before be arranged to be performed within twelve hours, but the work of extra men, with their consent, may be arranged in early and late shifts, provided that there be not less than eight hours between the end of one day's work and the beginning of the next, within which they may not be "required" to perform any work except in case of emer-

gency. It is specifically provided that on Sundays, as well as on legal holidays, and also in case of *any* emergency, instead of merely "accident or unavoidable delay", extra labor may be performed for extra compensation. Such extra labor may also be performed for extra compensation "at any time at the request of the employee." Moreover, the act does not affect any written contract existing at the time of its passage. Threats of loss of employment or of obstructing or preventing the obtaining of employment are declared to be "requiring" within the meaning of the act. Penalty, from \$100 to \$500 for each offense. (C. 533. In effect, January 1, 1913).

Mississippi.—It is declared unlawful for persons, firms or corporations engaged in manufacturing or repairing "to work their employees more than ten hours per day except in cases of emergency, or where public necessity requires." Penalty, from \$10 to \$50 for each day's violation. (C. 157. In effect, July 12, 1912).

New Jersey.—Sixty hours a week and ten a day, unless for the purpose of making shorter hours on the last day of the week, are all that any employee may be "required, permitted, or suffered" to work, except in cases of emergency, in establishments where biscuits, pies, bread, crackers, cakes, macaroni and other foodstuffs, confectionery, candy, ice cream, or frozen sweets are made for sale. In cases of emergency, employees may be permitted to work not more than two additional hours, for which they must be paid at the same rate as for their sixty-hour week. No employee may be discharged for having made a truthful statement as a witness in a court or to the commissioner of labor, his assistant, or an inspector in pursuance of this act. It is specially provided that if any section or provision of the act shall be questioned and held unconstitutional, the decision shall not affect any other section or provision. (C. 127. In effect, March 21, 1912).

New Mexico.—Employees engaged in or connected with the movement of any rolling stock, engine or train, must not be required or permitted to remain on duty more than sixteen consecutive hours; after sixteen hours continuously on duty they must not be required or permitted again to go on duty until they have had at least ten consecutive hours off; and after sixteen hours on duty in the aggregate in any twenty-four hour period they must not be required or permitted to go on duty again until they have had at

least eight consecutive hours off. But the provisions of the act do not apply in cases of casualty or unavoidable accident, or where delay is due to unknown or unforeseen causes, or to the time necessary to take passenger trains and freight trains loaded with live stock or perishable freight to the nearest division point, or to employees of sleeping car companies or crews of wrecking or relief trains. Maximum penalty for each violation, \$500. (C. 62. In effect, September 6, 1912). (See also "Administration of Labor Laws", p. 451).

IMMIGRATION

In Arizona, in conformity with a mandate of the constitution, aliens are excluded from public employment. New York, on the other hand, has made provision for the instruction of immigrants and has strengthened the law relating to immigrant lodging places.

Arizona.—Aliens who have not become or declared their intention of becoming citizens of the United States may not be employed by the state, by the counties, or by municipalities. This does not apply to prison labor. (C. 78. In effect, May 18, 1912). The same clause, with an addition applying it to contractors, is contained in the act relating to the construction and maintenance of state roads and bridges. (C. 68, sec. 10. In effect, May 18, 1912). (Special Session, C. 66, sec. 9. In effect, June 20, 1912).

New York.—The commissioner of labor is authorized to cooperate with the commissioner of education and other school officers to ascertain the necessity for and the extent to which instruction should be imparted to aliens within the state, to devise methods for the proper instruction of aliens, not only in the English language but in other subjects, and to establish and supervise classes for aliens. The provisions in regard to the licensing and regulation of immigrant lodging places now apply to all such places, except those maintained by charitable associations or religious societies, and not merely to places where "principally" immigrants or emigrants "are received, lodged, boarded or harbored". Applicants for renewal of licenses must make sworn statements, in whatever form the commissioner of labor shall prescribe, of the maximum number of boarders and lodgers received during the preceding year. (C. 543. In effect, April 19, 1912). The requirement that a bond shall be furnished by an applicant for a license to keep an immigrant lodging place is no longer arbitrary but is "in the discretion of the commissioner of labor." (C. 337. In effect, April 15, 1912). Penalty for violation of the law relating to the bureau of industries and immigration, from \$20 to \$50 for the first offense; from \$50 to \$250, or imprisonment for not more than thirty days, or both, for a second offense; and not less than \$250, or imprisonment for not more than sixty days, or both, for a third offense. (C. 383. In effect, April 15, 1912). (See also "Administration of Labor Laws", p. 452).

MISCELLANEOUS

These laws relate to the protection of working men in their employment and to rewards for suggested improvements in methods. Arizona and Massachusetts acts protect members of the militia from being deprived of employment on account of such membership, and the Minnesota corrupt practices act forbids employers to exercise political influence over their employees by reason of their power to discharge or to reduce wages. Two federal acts provide rewards for inventions or suggested economies in the Ordnance Department and in the Post-Office Service.

Arizona.—Managers, agents, foremen and other employees who hire laborers are forbidden to demand or receive, directly or indirectly, any fee, commission, or gratuity as the price or condition of employing or continuing in employment a workman or laborer. Penalty, from \$50 to \$300, or imprisonment for not more than six months, or both. (C. 18. In effect, May 8, 1912). Any person who wilfully deprives a member of the national guard of his employment, or prevents or obstructs in any way his employment because of such membership, or who dissuades anyone from enlisting by threat of injury in respect of his employment, is liable to a fine of from \$10 to \$100, or imprisonment for from ten to sixty days, or both. (C. 85, sec. 134. In effect, May 24, 1912).

Massachusetts.—Anyone who wilfully deprives a member of the militia or naval reserve of his employment, or denies him employment, or prevents his being employed by another, or obstructs or annoys him or his employer in respect of his trade or employment because of such membership or because of his necessary absence from business in performance of his duty as such member, and anyone who dissuades a person from enlisting in the militia or naval reserve by threat of injury to him in his employment, is liable to a fine of not more than \$500, or imprisonment for not more than six months, or both. (C. 358. In effect, April 1, 1912). The minimum fine for an agent or officer who receives a commission or bonus from a clerk or laborer whom he is authorized to hire for an employer is increased from \$10 to \$25, and the possible term of imprisonment is increased from one to three years. District attorneys are directed to prosecute violations of the act. (C. 495. In effect, May 16, 1912).

Minnesota.—The corrupt practices act provides that employers shall not give or have distributed to their employees any printed or written matter containing any threat, and that they shall not make, verbally or otherwise, any threat, that in case a particular ticket, political party, organization or candidate is elected or measure adopted, work in their establishments will cease, in whole or in part, or that salaries or wages will be reduced. They are also forbidden to make any other threat, "expressed or implied, intended or calculated to influence the political opinion or actions of workmen or employees". Penalty, \$25 to \$1,000, or imprisonment in the county jail for from one month to a year, or imprisonment in the state prison for from one to three years, or both. (Special Session, June, 1912, C. 3, secs. 23 and 41. In effect, June 20, 1912).

New Mexico.—Employees may have two hours time from their employment on election day in which to vote, without being liable to any penalty, the hours to be specified by the employer. Employers are forbidden to attempt in any manner to control the votes of employees by offering rewards, threatening discharge, or otherwise intimidating them. Penalty, from \$50 to \$100. (C. 15. In effect, September 6, 1912). The corrupt practices act also forbids employers and the agents of employers directly or indirectly to discharge or threaten to discharge an employee on account of his political opinions or to influence the vote of an employee by the power of discharge or "by any corrupt and unlawful means". Penalty, from \$100 to \$1,000, or imprisonment for not more than six months, or both. A special section applies to corporations, which are liable to a penalty of from \$100 to \$1,000, with an additional penalty for anyone by or through whom the act is committed of not more than \$100, or imprisonment for not more than six months, or both. (C. 63, secs. 2 and 3. In effect, September 6, 1912). Railroad employees may vote elsewhere than in the precinct in which they are registered when necessarily absent from that precinct on account of the duties of their occupation. They must present certificates of registration, and other rules are laid down for voting in such cases. (C. 73. In effect, September 6, 1912).

United States.—The Secretary of War is authorized to offer periodically at selected establishments of the Ordnance Department cash rewards for the most valuable suggestion for improvements or

economies in manufacturing processes or plants, submitted by employees within the period. The total amount paid must not exceed \$1,000 a month; it must be given for suggestions that will clearly effect economy, increase efficiency, or improve quality; the sums awarded must be in addition to the usual compensation of employees; and no employee may be paid a reward until he has executed an agreement that the use by the United States of his suggestion shall not form the basis of any further claim and that no application for patent has been made for the invention. (C. 236. In effect, July 17, 1912). The Postmaster General is authorized to pay rewards to employees whose inventions are adopted for use in the postal service. (C. 389. In effect, August 24, 1912).

PENSIONS, OLD AGE

The movement for old age pensions for employees of private industries made little progress during the year, though a joint resolution of the Maryland legislature urged the appointment of a federal commission to investigate the subject. The Massachusetts and New Jersey retirement systems for public employees were extended, but no new states enacted legislation of this character.

Maryland.—A joint resolution urges the appointment of a federal commission to investigate the subject of old age pensions and report to Congress. (J. R. 13).

Massachusetts.—The act of 1911 establishing a retirement system for employees of the commonwealth is amended in many important details. (C. 363. In effect, April 2, 1912). A new law authorizes cities and towns, other than Boston, to retire and pension laborers. Those cities and towns which accept the act may, on request, retire and pension laborers who have been in their employ for not less than twenty-five years, have attained the age of sixty and have become physically or mentally incapacitated for labor, and also laborers who have been in their employ for not less than fifteen years and have become physically or mentally incapacitated for labor by reason of injuries received in the performance of their duties. They must retire and pension laborers who have been in their employ for twenty-five years and have attained the age of sixty-five. The act must be submitted to the voters of each city and town in the commonwealth except Boston at the next annual state election. (C. 503. In effect, April 16, 1912).

New Jersey.—The pension plan is extended to employees of penal institutions and reformatories who have been employed, with good records, for twenty years or more and who are incapacitated properly to perform their duties. The pension paid is equal to one-half the salary at the time of retirement, but may not be less than \$50 per month. (C. 323. In effect, April 1, 1912).

PRISON LABOR

The tendency toward the state-use system continued in 1912 as in 1911. Virginia, however, provided for the employment of a certain number of convicts in quarrying and grinding limestone and oyster shells for private sale under certain restrictions. New Jersey authorized the appointment of a convict labor commission to formulate plans for using prison labor in ways which will not bring it into competition with free labor.

Kentucky.—It is provided that an act amending the constitution so as to allow the employment of convict labor upon public roads and bridges, shall be submitted to the voters. (C. 33).

Maryland.—Prisoners in the county jail of Garrett county, whose term of commitment does not exceed one year, may be sentenced to hard labor on the roads of that county, under the direction of town or county commissioners, but their hours of labor may not exceed ten a day. (C. 597. In effect, April 11, 1912).

Massachusetts.—The prison commissioners are directed to cause articles and materials used by offices and departments (as well as by public institutions) of cities and towns (as well as of counties and of the commonwealth) to be produced by prison labor. (C. 565. In effect, June 5, 1912).

Mississippi.—Convicts on penitentiary farms in four counties, who are over eighteen and under fifty years of age, may be required to work fifteen days annually on certain county roads. (C. 146. In effect, March 16, 1912).

New Jersey.—The appointment is authorized of a convict labor commission to formulate a comprehensive plan for the use of "the labor of all convicts, physically able, on the public roads, in public parks, in forestry and in such other ways to the public benefit, not in competition with free labor". The commission is non-partisan and consists of eight members, two of whom are trade-union representatives. (J. R. 5. In effect, March 28, 1912). By making application to the prison labor commission, counties may have prisoners assigned to work upon roads. (C. 223. In effect, March 28, 1912). The act of 1911 relating to prison labor is amended in several minor details. (C. 139. In effect, July 4, 1912). (C. 402. In effect, April 16, 1912).

New Mexico.—Convicts who are working as mechanics, acting

as foremen or trusties, and others who work outside of the walls of the penitentiary are allowed ten days additional "good time" per month while engaged in such labor. (C. 53. In effect, September 6, 1912).

New York.—Convict labor may be employed by the conservation commission in propagating trees and in field planting. (C. 444, sec. 62. In effect, April 16, 1912).

Virginia.—A "convict lime board" is formed to put convicts to work in quarrying and grinding limestone and oyster shells. The board may acquire suitable lands, machinery, etc., and may dispose of the ground limestone and shells and of the by-products, the former at cost, including the maintenance and care of the prisoners, interest on the investment and depreciation of the machinery, and the latter for "a fair price". Cash must be paid; no sale may be made to any person except for his own use; and not more than one carload of ground limestone and shells may be sold to a single purchaser in any one year if there are other applicants. Appropriation, \$30,000. (C. 295. In effect, June 13, 1912).

TRADE UNIONS AND TRADE DISPUTES

The fight of the United States post-office employees for the right to organize without being in danger of demotion or dismissal from the service resulted in a half victory by which organization is permitted but affiliation with the American Federation of Labor or any other central trade union is practically forbidden. "Black-listing" is forbidden in Arizona and in New Mexico.

Arizona.—Soliciting, giving out, or taking part in the exchanging of a labor "black list" is prohibited. The term "black list" is carefully defined and is made to include any name or list of names, not only written or printed but even spoken, provided it is given in pursuance of an agreement that the receiver shall discharge or refuse to employ the persons designated. Penalty, liability in punitive damages to the person injured, and a fine of from \$50 to \$250, or imprisonment for from ten to sixty days, or both. (C. 61. In effect, May 17, 1912).

Massachusetts.—Under a former law an employer was obliged, during the continuance of a strike, lockout, or other labor trouble in his establishment, to state in all advertisements for employees to fill the places of strikers that such labor disturbance existed. Under the new law these provisions cease to be operative after the state board of conciliation and arbitration has determined that the business of the employer is being carried on in the normal and usual manner and to the normal and usual extent. The board, on application of the employer, must determine this question as soon as possible. (C. 545. In effect, April 27, 1912).

Mississippi.—It is resolved by a concurrent resolution to appoint a committee to investigate the strike and look into the advisability of keeping the state militia at McComb City and Water Valley. (C. 443. Passed the Senate, January 9, and the House, January 10, 1912). The leaders of both sides in the strike at McComb City and Water Valley are memorialized by a concurrent resolution to settle their difficulties by arbitration. (C. 435. Passed the House, January 23, and the Senate, February 15, 1912). Another concurrent resolution expresses sympathy for the striking employees of the Illinois Central Railroad so long as they obey the law and commit no acts of violence, and expresses the hope that organized capital may be compelled by public opinion to recognize organized

labor. (C. 436. Passed the House, February 8, and the Senate, February 12, 1912).

New Mexico.—Employers are forbidden, after having discharged an employee, “to prevent or attempt to prevent by word, sign or writing of any kind” the discharged employee from obtaining other employment. Employers, however, may give the true reasons, either in writing or otherwise, for the discharge of an employee. Penalty, from \$100 to \$1,000, liability in damages to the party injured, and liability for a reasonable attorney’s fee. (C. 33. In effect, September 6, 1912).

United States.—The post-office appropriation act provides that membership in an organization of postal employees having for its object improvements in the condition of labor of its members, including hours, wages, and leave of absence, shall not be a cause for reduction in rank or removal from the postal service; provided the organization is “not affiliated with any outside organization imposing an obligation or duty upon them to engage in any strike, or proposing to assist them in any strike, against the United States”. It is also provided that postal employees may not be penalized for presenting their grievances to members of Congress, and that the right “of persons employed in the civil service of the United States”, to petition Congress or any member of Congress or to furnish information to Congress “shall not be denied or interfered with”. This act also provides that the periodical publications of trades’ unions may be admitted to the mails as second-class matter. (C. 389. In effect, August 24, 1912).

UNEMPLOYMENT

Laws relating to private employment agencies were enacted or amended in Mississippi and New York, and South Carolina passed a law requiring employers to give their employees advance notice of shutdowns.

Mississippi.—Emigrant or employment agents who solicit laborers to go beyond the limits of the state must pay an annual license of \$500. Penalty for doing business without such a license, from \$500 to \$5,000, or imprisonment for from one to six months. (C. 94. In effect, March 11, 1912).

New York.—The law in regard to the licensing of employment agencies is amended to provide that, when a license has been revoked, the mayor or commissioner of licenses may issue another license to the same person after the expiration of three years. Formerly a person whose license had been revoked could never obtain another. (C. 261. In effect, April 11, 1912).

South Carolina.—Employers who require notice of quitting work must, in turn, notify their employees of shutdowns by posting in every room a printed notice stating the date of beginning the shutdown and its approximate length. These notices must be posted at least two weeks before the shutdown, or for the same time that is required of employees before quitting. Shutdowns caused by some unforeseen accident to machinery, "or by some act of God or of the public enemy", are excepted. Maximum penalty, \$5,000. In addition to the penalty, employers are liable to each one of their employees for damages suffered by the failure to give notice. (No. 424. In effect, February 23, 1912).

WAGES

The New Jersey act reducing the amount of court fees in suits for wages when the amount demanded is less than \$20 was one of the important laws enacted during the year. The assignment of wages was regulated in Kentucky; and mechanics' lien laws were amended in that state, in Mississippi, and in New Jersey. The latter state also appointed a commission to revise the mechanics' lien laws. Payments in lawful money were required once a month in Mississippi and twice a month in most employments in Virginia. In Arizona companies and corporations were required to pay bi-monthly, and obtaining labor under false pretenses was forbidden. In a number of states the wages of public employees were increased.¹

A. PUBLIC EMPLOYMENT.

Arizona.—Wages paid laborers, workmen, and mechanics employed by the state or any of its political subdivisions, or employed by contractors or subcontractors on work for the state, may not be less than the current rate of per diem wages in the locality where the work is performed. But the act does not apply to existing contracts. Penalty, from \$50 to \$1,000, or imprisonment for not more than six months, or both. (C. 78. In effect, May 18, 1912). All departments and institutions of the state, county and municipal corporations, and all contractors working for the state, or any of its divisions, must designate regular pay days not more than sixteen days apart, and must post notices of such pay days in at least two conspicuous places where they can be seen by employees as they go to and from their work. Payments must be made in lawful money or negotiable bank checks payable on demand, and must be in full, except that wages for not more than five days' labor may be withheld. Penalty, from \$50 to \$500 for each offense. (Special Session, C. 10. In effect, June 8, 1912).

B. PRIVATE EMPLOYMENT.

Arizona.—Companies and corporations doing business in the state must designate regular pay days not more than sixteen days apart, instead of monthly as before, and must post notices of such pay

¹ Mere increases in the wages of groups of public employees are not here given.

days in at least two conspicuous places where they can be seen by employees as they go to and from their work. Payments must be made in lawful money or negotiable bank checks payable on demand, and must be in full, except that wages for not more than five days' labor may be withheld. Penalty, from \$50 to \$500 for each offense. (Special Session, C. 10. In effect, June 8, 1912). Anyone who employs labor for wages without having sufficient assets in the state to cover the amount of wages for two weeks, and who pretends to have such assets and then fails to pay for five days after the wages are due, is declared guilty of obtaining labor under false pretenses. Penalty, imprisonment for not more than a year, or a fine of not more than three times the amount of the wages due. In such a case the plaintiff may recover not only costs but reasonable compensation for time lost and an attorney's fee. (Special Session, C. 16. In effect, June 11, 1912). The section of the mechanics' lien law relating to liens on mines is amended. (C. 66. In effect, August 16, 1912).

Kentucky.—Only a fixed and definite part of future wages, to be earned during a period not exceeding ninety days, may be assigned for the payment of sums less than \$200. Such assignments are not valid unless the instrument is in writing, signed by the assignor, and containing the dates of signature and of delivery of the money; the exact amount of the consideration, of the interest, and of all other fees to be paid; the date of maturity or of payment of each instalment; and the name and address of the assignee or assignees and, in case the assignee be a non-resident, of some person in the state upon whom process may be served in the event of litigation. The instrument is valid against an employer only if it contains his signature or if notice of the assignment has been given him within three days after it has been made, and it is valid against a wage-earner only if a true and complete copy has been delivered to him at or before the time of payment of the consideration. No instrument is valid if this copy has been thereafter taken from him, or mutilated, altered or destroyed, either with or without his consent, by the assignee or his agent. If a wage-earner demands it the assignee must furnish him, on payment of ten cents, with another exact copy of the instrument, any false statement on which makes the original invalid. The time and amount of all payments must be indorsed on the wage-earner's copy and on the

original, and failure to do so invalidates the instrument. National banks, state banks, and trust companies are exempt from the provisions of the act. (C. 126. In effect, June 10, 1912). The mechanics' lien law is amended so that persons who have contracted directly with the owner or his agent come under the act without giving any notification, and so that persons who have not contracted directly may come under the act by notifying the agent or owner of their intention to hold the property liable, within thirty-five days, instead of immediately as before, after the last labor has been furnished. (C. 115. In effect, June 10, 1912).

Maryland.—Employers of farm labor in Anne Arundel county are given the right to eject, on specified notice in writing, employees who leave their employ or are discharged, from dwelling houses occupied as part of their compensation. (C. 682. In effect, April 8, 1912).

Massachusetts.—(See "Child Labor", p. 461 and "Woman's Work", p. 497).

Mississippi.—Manufacturers must pay their employees in money at least once a month, but they may hold back fifteen days' wages earned immediately before the regular pay day. An employee who brings suit successfully under this act may also recover a reasonable attorney's fee. (C. 141. In effect, March 11, 1912). The mechanics' lien law is amended so as to make it more effective. (C. 232. In effect, March 16, 1912).

New Jersey.—In suits for wages or personal services, if the amount demanded is less than \$20, and if the party makes affidavit that he is unable to pay the ordinary costs, the clerks and sergeants-at-arms of district courts must give their services without the payment of any costs and the judge in such cases may order that no costs shall be taxed. The amount of judgments obtained under this act must be paid into court and the clerk must deduct the costs before paying the amount to the plaintiff. (C. 202. In effect, March 28, 1912). The title of the act relating to the assignment of wages and salaries is changed. (C. 394. In effect, April 15, 1912).

The appointment of a commission of four to revise and codify the mechanics' lien laws is authorized. (C. 321. In effect, April 1, 1912). The provisions of the mechanics' lien law relating to the filing of claims and the discharge of lands and buildings from liens

are amended. (C. 265. In effect, July 4, 1912). (C. 294. In effect, July 4, 1912).

Virginia.—The law providing for the payment of wages at regular intervals and in lawful money is extended to include railroad shops as well as mining and manufacturing industries. Payments, except in mining, excelsior mills and saw mills, in which employees may be paid monthly as before, must be made twice a month. (C. 106. In effect, June 13, 1912).

WOMAN'S WORK

A notable achievement of 1912 in labor legislation was the minimum wage law of Massachusetts, the first experiment of the kind in the United States. Though the original bill advocated by the commission on minimum wage boards was decidedly weakened by amendments before passage, though no method except the force of public opinion was provided by which employers may be forced to pay the minimum wage, and though the wage determined upon is itself subject to judicial review, the act is of great importance as the first step in the direction of legislative control of wages, as well as of hours in private employments.

Progress was also made in several states in the limitation of hours of labor for women. The eight-hour laws of California and Washington, enacted in 1911, were both sustained by the supreme courts of those states. The Illinois supreme court also sustained the 1911 law extending the operation of the ten-hour law to additional industries, including hotels. New York followed the example set by Massachusetts last year and prohibited the employment of women within four weeks after childbirth, and Massachusetts required seats for women, whenever the work can be performed properly in a sitting position, while at work as well as when not actively employed.

Arizona.—Women may not be “employed, permitted, or suffered to work” in any occupation which requires them to remain standing constantly, or in or about any mine, quarry, or coal breaker. In all establishments in which a minimum age for child labor is established (see p. 456) at least two accessible seats must be provided for every three women employees, and women must be allowed to use these seats when they are not actively at work. Penalty for failure to provide seats, from \$10 to \$50. (C. 32. In effect, May 13, 1912).

Kentucky.—Females under twenty-one may not be “employed or permitted or suffered to work” in any gainful occupation, except domestic service and nursing, more than ten hours a day and sixty a week; and females of any age may not work more than that time in laundries, bakeries, factories, workshops, stores, hotels, restaurants, telephone exchanges, telegraph offices, mercantile, manufacturing or mechanical establishments. In this list of industries em-

employers must keep time books showing the hours of employment of each woman; these books must be open to inspection by the state labor inspector and his assistants; and there must be posted in a conspicuous place in each workroom a printed copy of the law and also a printed notice, in a form furnished by the state labor inspector, giving the hours of beginning and ending work and the number of hours a day of each female employee.

All employers of females must provide seats for their use in the room where they work and must permit them to use these seats "when not necessarily engaged in the active duties for which they are employed". In stores and mercantile establishments at least one seat must be furnished for every three females employed; it is provided that seats shall be placed in specified places; and folding seats are not sufficient. Employers of female labor must also provide proper wash-rooms and toilet-rooms and, when both sexes are employed, their toilet facilities must be in rooms which are entirely separate and have entirely separate entrances. If the nature of the work in which women are employed requires a change in clothing, a dressing room must be provided for them. Penalty, from \$25 to \$50 for the first offense, and for each subsequent offense, \$50 to \$200, or imprisonment for from ten to ninety days, or both. (C. 77. In effect, June 10, 1912). (See also "Administration of Labor Laws", p. 447).

Maryland.—No female may be "employed or permitted to work" in any manufacturing, mechanical or mercantile establishment, printing office, bakery or laundry more than ten hours a day or sixty hours a week. If any part of her work is done before 6 a. m. or after 10 p. m. she may not work more than eight hours a day; and no female may work more than six hours continuously in establishments where three or more females are employed, without an interval of at least half an hour, unless her hours are not more than six and a half a day. But establishments in Allegany county, provided their average working day for the year does not exceed nine hours and the entire working force is employed on full time for the entire year, and provided that for a period of not less than four months their employees have been working less than nine hours, are allowed to employ females for not more than twelve hours a day to meet seasonal demands. The provisions of this law, moreover, do not apply to females employed in canning or

preserving or preparing for canning or preserving perishable fruits and vegetables. Printed notices giving the provisions of the law and the hours of beginning and stopping work must be posted in a conspicuous place in every room of the establishments to which the law applies. Maximum penalty for first offense, \$100; for second or subsequent offense, \$1,000, or imprisonment for not more than one year, or both. (C. 79. In effect, May 1, 1912). (See also "Administration of Labor Laws", p. 447).

Massachusetts.—A minimum wage commission is established to provide for the determination of minimum wages for women and children. The commission consists of three members, one of whom may be a woman, appointed by the governor for terms of three years, and it is arranged that the term of one member shall expire each year. Commissioners receive \$10 for each day's service in addition to traveling and other expenses. The appointment of a secretary, to whom the rules of the civil service commission do not apply, is authorized, and annual reports must be made.

Whenever the commission has reason to believe that the wages paid "to a substantial number" of female employees in any occupation "are inadequate to supply the necessary cost of living and to maintain the worker in health", it must inquire into the matter and if, after investigation, it is of the opinion that the wages paid such employees are actually inadequate, it must establish a wage board consisting of at least six representatives of the employers and the same number of representatives of the female employees in the occupation, and of one or more disinterested persons—but not to exceed half the number of representatives of employers or employees—to represent the public. The chairman must be designated by the commission from among the representatives of the public; and the commission also makes rules and regulations governing the selection of the other members and the procedure, has general jurisdiction over the work, and may transmit to each board all pertinent information in its possession. The members of wage boards are allowed compensation at the same rate as jurors, and also necessary traveling and clerical expenses. Each board must take into consideration "the needs of the employees, the financial condition of the occupation, and the probable effect thereon of any increase in the minimum wages paid", and must "endeavor to determine the minimum wage, whether by time rate or piece rate,

suitable for a female employee of ordinary ability in the occupation in question, or for any or all of the branches thereof, and also suitable minimum wages for learners and apprentices and for minors below the age of eighteen years." Minimum wage determinations agreed to by two-thirds of the members of a board must be reported to the commission, with all reasons and facts relating to them, and also with the names, so far as they can be ascertained by the board, of all employers who pay less than the minimum.

The commission may approve or disapprove any or all of the recommendations or may recommit the subject to the same or to a new wage board. If the commission approve any or all the recommendations it must give a public hearing, after fourteen days' notice, to employers paying less than the approved minimum and, if it then finally approve, must enter a decree of its findings, noting in the decree the names of employers who fail or refuse to accept the minimum wage. Within the next fourteen days these names, with a statement of the findings of the commission and of the minimum wages paid by each employer, must be published, in type no smaller than that of news matter and attested by the names of a majority of the commission, in at least four newspapers in each county. But an employer may obtain a stay of execution by filing a declaration under oath in the supreme judicial or superior court that compliance with the decree would be likely to endanger the prosperity of the business, and this court, if it finds his declaration true, must issue an order revoking the decree.

If a majority, but less than two-thirds, of the wage board concur in a recommendation, the commission may report the recommendation and all pertinent facts to the general court. After a minimum rate has been established the wage board may be reconvened or a new one established by the commission on petition of either employers or employees, and new recommendations must be dealt with in the same manner as before. To women who are physically defective licenses may be issued authorizing employment at a special rate of wages lower than the minimum in occupations for which only a minimum time rate has been established.

Employers must keep a register, open to the inspection of the commission or its agents, of the names and addresses of all women employees. The commission has the power to subpoena witnesses,

administer oaths, take testimony, and examine the books and records of employers which relate to the wages paid women and children. The duty of collecting the statistics and other data required devolves on the bureau of statistics, but the cost must come out of the appropriation made for the expenses of the commission. There is no penalty except publicity for failure to pay the minimum wages, but the commission must determine from time to time whether employers are obeying its decrees and must republish the names of those who are not. No member of the commission and no newspaper publisher is liable to an action for damages for publishing the names of employers violating decrees, unless the publication contains some wilful misrepresentation. Minimum penalty for a newspaper which refuses or neglects to publish the findings, decrees or notices of the commission at its regular rates, \$100. Penalty for an employer who discharges or discriminates against an employee because the employee has testified or is about to testify, or because the employer believes the employee may testify in any investigation or proceedings relative to the enforcement of the act, \$25 for each offense. (C. 706. In effect, July 1, 1913). (See also "Child Labor", p. 461).

The state board of health is directed to investigate core rooms where women are employed and to make rules relating to the structure and location of such rooms, the emission of gases and fumes from ovens, and the size and weight which women may be allowed to lift or work on. A copy of the rules must be posted in every core room where women are employed. Penalty for violation of such rules, from \$25 to \$500. (C. 653. In effect, June 26, 1912). (See also "Administration of Labor Laws", p. 449).

The law requiring seats to be provided for women employees is amended; the provisions for the use of such seats are strengthened; and it is further enacted that, except when the work cannot properly be performed in a sitting position, seats shall be provided and their use permitted while women are at work as well as when they are not actively employed. (C. 96. In effect, March 15, 1912). The act of 1911 limiting the hours of women and of children under eighteen in manufacturing and mercantile establishments to fifty-four a week is strengthened by requiring that if any woman or child be employed in more than one such establishment the total number of hours shall not exceed fifty-four a week. (C. 472. In effect,

May 12, 1912). The act of 1911 limiting the hours of women and children garment workers in workshops connected with mercantile establishments to fifty-six a week is amended, omitting workshops for the making of garments. (C. 452. In effect, April 7, 1912).

New Jersey.—Women must not be “employed, allowed or permitted” to work more than ten hours a day or sixty a week and not more than six days a week in manufacturing and mercantile establishments, bakeries, laundries or restaurants; but mercantile establishments are excepted during the six working days before Christmas; and the law does not apply to canneries. All establishments affected must keep an abstract of the law posted in plain view of employees coming in or going out, and must also keep a record, open to the inspection of the department of labor, of the hours of work of each employee. The establishments regulated are carefully defined and the procedure for violations is specified in detail. Penalty for the first offense, from \$25 to \$50, and for a second offense, from \$50 to \$200. (C. 216. In effect, October 1, 1912). (See also “Administration of Labor Laws”, p. 450).

New York.—The employment of a woman in a factory, mercantile establishment, mill or workshop, within four weeks after she has given birth to a child, is forbidden. (C. 331. In effect, April 15, 1912). The hours of labor of women in factories are reduced from ten to nine a day and from sixty to fifty-four a week. But they may be employed more than nine hours a day, regularly for not more than five days a week in order to make a short day or holiday on the sixth day, or irregularly for not more than three days a week, provided they are not required or permitted to work over ten hours a day, instead of twelve as before, and not over fifty-four hours a week, instead of sixty as before. It is specifically provided that the sections limiting hours of labor shall not apply to the employment of women and minors sixteen years of age and over in canning or preserving perishable products between June 15 and October 15 of each year. (C. 539. In effect, October 1, 1912). A female employee other than a domestic servant who brings action to recover wages, if found entitled to costs, may be “allowed” in “the discretion of the court”, instead of as before “recovers”, \$10 in addition to the usual costs when the amount of damages is over \$10, and \$5 as additional costs when the amount is less than \$10. (C. 468. In effect, April 18, 1912).

Virginia.—No female may work in a coal mine. Penalty, from \$10 to \$500, or imprisonment for from ten to ninety days. (C. 178, sec. 15. In effect, June 13, 1912). The ten-hour law for factories and manufacturing establishments is extended to cover workshops and mercantile establishments, but exceptions are made of women whose full time is employed as bookkeepers, stenographers, cashiers, or office assistants, of establishments engaged exclusively in packing fruits and vegetables from July 1 to November 1, of mercantile establishments in towns of less than 2,000 inhabitants, and of mercantile establishments on Saturdays. (C. 248. In effect, June 13, 1912).

II. TOPICAL INDEX BY STATES

The labor laws enacted by the thirteen states which held regular legislative sessions in 1912, and by the seven states which held special sessions during the year, are indexed below in alphabetical order with chapter and page references to the session laws of each state. The new federal laws and the laws enacted by the two states (California and Texas) which held special sessions late in 1911, are also included. Since the Vermont legislature does not convene until October, the record of its session could not be included here.

ARIZONA

Accidents and Diseases: accidents to be reported by public service corporations, C. 90, secs. 44, 76 and 77, p. 527, 557-558; accidents in mines to be reported, C. 33, secs. 13 and 39, p. 93, 110.

Administration of Labor Laws: enforcement of child labor law, C. 32, p. 77; penalty for violating eight-hour law for hoisting engineers, C. 26, p. 57; mine inspection department created, C. 33, p. 87; appropriations, C. 92, p. 580.

Child Labor: minimum age, hours and employment certificates, C. 32, p. 77; employment during school hours, C. 77, sec. 89, p. 399; in mines, C. 33, p. 87; as telegraph operators, C. 8, p. 20.

Employers' Liability and Workmen's Compensation: compulsory compensation act, Special Session, C. 14, p. 23; employers' liability in dangerous occupations, C. 89, p. 491; railroad employees not to contract out, C. 13, p. 27; damages not to be obtained by false statements, C. 90, secs. 23, and 76-79, p. 514, 557-559.

Hours of Labor: eight in all public employment, C. 78, p. 415; eight in mines and smelters, C. 28, p. 59, and Special Session, C. 26, p. 85; eight in electric light and power plants, C. 50, p. 227.

Immigration: aliens not to be employed by the state, C. 78, p. 416; C. 68, sec. 10, p. 335; Special Session, C. 66, sec. 9, p. 192.

Mines: detailed provisions for safety, C. 33, p. 87.

Miscellaneous: agents of employers not to receive bribes, C. 18, p. 36; protection in employment of members of the national guard, C. 85, sec. 134, p. 475.

Railroads: number of men to be employed on trains prescribed, C. 16, p. 31; certain locomotives not to be used, C. 30, p. 73; length of trains limited, C. 43, p. 195; previous experience required of engineers and conductors, C. 47, p. 206; tampering with switch lights or signals forbidden, C. 63, p. 288; headlights required on engines, C. 27, p. 58; corporation commission given power to require health and safety devices, C. 90, sec. 42, p. 525.

Trade Disputes: "black lists" forbidden, C. 61, p. 286.

Wages: bi-monthly pay days and payment in lawful money, Special Session, C. 10, p. 14; obtaining labor under false pretenses, Special Session, C. 16, p. 54; amendment of mechanics' lien law, C. 66, p. 296; wages of public employees not less than current rate, C. 78, p. 415.

Woman's Work: not to work in certain occupations and seats to be provided, C. 32, p. 77.

CALIFORNIA

Accidents and Diseases: accidents to be reported, Extra Session, 1911, C. 53, p. 217; all public utilities to report accidents, Extra Session, C. 14, sec. 44, p. 40.

Employers' Liability and Workmen's Compensation: additional duties and powers conferred on industrial accident board, Extra Session, 1911, C. 39, p. 166.

GEORGIA

(No labor laws. Regular Session.)

IDAHO

(No labor laws. Special Session.)

ILLINOIS

Administration of Labor Laws: limiting salaries of mine inspectors, Second Special Session, 1912, S. B. 10, p. 31; two female investigators in factory inspection department, Second Special Session, 1912, S. B. 10, p. 34.

Employers' Liability, Workmen's Compensation and Insurance: regulating mutual insurance companies, Second Special Session, 1912, H. B. 22, p. 48.

KENTUCKY

Administration of Labor Laws: woman inspector and woman assistant inspector authorized, C. 108, p. 304.

Child Labor: ten hours a day, sixty a week, for females under twenty-one, C. 77, p. 232.

Prison Labor: act amending the constitution to allow the employment of convict labor on the roads and bridges to be submitted to the voters, C. 33, p. 150.

Wages: the assignment of wages for sums under \$200 regulated, C. 126, p. 449; lien law amended, C. 115, p. 389.

Woman's Work: ten hours a day and sixty a week in certain employments, and seats, wash rooms, and toilet rooms to be provided, C. 77, p. 232.

LOUISIANA

(Session laws not yet available.)

Child Labor: in theatrical exhibitions and concerts, Act No. 184; in billiard and pool rooms, Act No. 25.

MAINE

(No labor laws. Special Session.)

MARYLAND

Accidents and Diseases: occupational diseases to be reported, C. 165, p. 330.

Administration of Labor Laws: three women inspectors provided for the enforcement of the woman's work law, C. 79, p. 141; number of inspectors to enforce child labor law increased, C. 731, p. 1212; compulsory school law and provisions for attendance officers strengthened, C. 173, p. 339.

Child Labor: age limit raised, employment in dangerous trades forbidden, messenger service regulated, and provisions for employment certificates adopted, C. 731, p. 1212.

Employers' Liability, Workmen's Compensation, and Insurance: system of compensation authorized and regulated, C. 837, p. 1624; law in regard to miners' and operators' cooperative relief fund amended, C. 445, p. 624.

Mines: appropriation for miners' hospital, C. 441, p. 617.

Pensions, Old Age: urging appointment of federal commission to investigate, J. R. 13, p. 1666.

Prison Labor: hours of labor on roads limited to ten a day in Garrett county, C. 597, p. 869.

Wages: ejectment of farm laborers from dwelling houses, C. 682, p. 1065.

Woman's Work: hours limited to ten a day or sixty a week in certain employments, C. 79, p. 141.

MASSACHUSETTS

Accidents and Diseases: accidents to be reported, C. 409, p. 349; seats for elevator operators, C. 479, p. 409.

Administration of Labor Laws: state board of labor and industries established, C. 726, p. 835; enforcement of new laws, C. 635, p. 714, and C. 479, p. 409; inspection of steam boilers strengthened, C. 531, p. 484.

Child Labor: determination of minimum wages, C. 706, p. 780; seats to be provided, C. 96, p. 72; hours in manufacturing and mercantile establishments, C. 477, p. 407; hours of garment workers, C. 452, p. 382.

Employers' Liability and Workmen's Compensation: compensation act amended, C. 172, p. 116, and C. 571, p. 577; notifications in liability actions, C. 251, p. 170; amount of damages recoverable increased, C. 354, p. 284; rights and powers of mutual insurance companies, C. 311, p. 209; powers of insurance commissioner, C. 666, p. 729; railroad passes for injured employees, C. 488, p. 420.

- Factories and Workshops:* safeguarding of machinery, light, and ventilation, C. 318, p. 240; egress in case of fire, C. 369, p. 309.
- Hours:* weekly half holidays in summer for certain employees, C. 528, p. 481; nine-hour day for conductors, motormen, and trainmen, C. 533, p. 489.
- Miscellaneous:* protection of members of militia and naval reserve in their employment, C. 358, p. 286; penalty for receiving bribe to procure employment increased, C. 495, p. 433.
- Pensions, Old Age:* state retirement act amended, C. 363, p. 292; pensions for laborers employed by cities and towns, C. 503, p. 449.
- Prison Labor:* materials and articles to be made, C. 565, p. 567.
- Trade Disputes:* advertisements for employees to fill the place of strikers, C. 545, p. 498.
- Woman's Work:* minimum wage commission established, C. 706, p. 780; regulation of employment in core rooms, C. 653, p. 714; seats required for use while at work, C. 96, p. 72; hours in manufacturing and mercantile establishments, C. 447, p. 407; hours of garment workers, C. 452, p. 382.

MICHIGAN

- Employers' Liability, Workmen's Compensation, and Insurance:* abolish defenses and providing elective system of compensation, First Extra Session, 1912, No. 10, p. 20; authorizing mutual insurance companies of employers who have elected to come under the compensation act, First Extra Session, 1912, No. 12, p. 40.

MINNESOTA

- Child Labor:* forbidden in certain occupations, night work forbidden, and educational requirements raised, Special Session, June, 1912, C. 8, p. 44.
- Miscellaneous:* employers forbidden to threaten with discharge or reduction in wages in case particular political party or candidate is elected, Special Session, June, 1912, C. 3, secs. 23 and 41, p. 33, 39.

MISSISSIPPI

- Child Labor:* age limit for girls raised and hours decreased, C. 165, p. 173.
- Employers' Liability:* railroad law extended to other transportation companies, C. 215, p. 290.
- Hours:* ten-hour day in factories and repair shops, C. 157, p. 165.
- Prison Labor:* certain convicts to work on roads, C. 146, p. 155.
- Railroads and Street Cars:* roofs required over repair tracks for cars, C. 152, p. 161; vestibules and means of heating required on street cars, C. 148, p. 157.
- Trade Disputes:* concurrent resolutions relative to McComb City and

Water Valley strike, C. 443, p. 466, and C. 435, p. 462; concurrent resolution relative to strike on Illinois Central, C. 436, p. 462.

Unemployment: license required of employment agencies, C. 94, p. 73.

Wages: monthly payments, C. 141, p. 146; liens, C. 232, p. 304.

NEVADA

(No labor laws. Special Session.)

NEW JERSEY

Accidents and Diseases: accidents to be reported, C. 156, p. 225; occupational diseases to be reported, C. 351, p. 603.

Administration of Labor Laws: two additional factory inspectors authorized, C. 67, p. 97; labor department placed in classified civil service, C. 83, p. 114; salary of the commissioner of labor raised, C. 117, p. 164; enforcement of woman's work law, C. 216, p. 337.

Child Labor: minimum age for night work in certain establishments, C. 127, p. 180.

Employers' Liability and Workmen's Compensation: judges' orders to be filed with commissioner of labor, C. 316, p. 555; costs in actions, C. 356, p. 624; period for beginning actions by executor, C. 175, p. 265.

Factories and Workshops: ventilation of rooms where heat, steam, gases, vapors, or dust are generated, C. 5, p. 20; guarding of machinery, C. 6, p. 21; bakery law revised and extended, C. 127, p. 180.

Hours: ten-hour day and sixty-hour week in bakeries and certain other food manufacturing establishments, C. 127, p. 180.

Pensions, Old Age: pension system extended, C. 323, p. 564.

Prison Labor: commission to formulate plan for use of, J. R. 5, p. 945; work on roads, C. 223, p. 360; act of 1911 amended, C. 139, p. 202; C. 402, p. 847.

Wages: costs in suits for wages under \$20, C. 202, p. 317; title of assignment act changed, C. 394, p. 808; commission to revise mechanics' lien laws, C. 321, p. 562; mechanics' lien law amended, C. 265, p. 175; C. 294, p. 522.

Woman's Work: ten-hour day and sixty-hour week in certain establishments, C. 216, p. 337.

NEW MEXICO

Accidents and Diseases: notification of accidents in coal mines required, C. 80, p. 154.

Administration of Labor Laws: appointment of inspector of mines authorized, C. 80, p. 148; appropriation, C. 83, p. 198; state corporation commission and district attorneys to enforce law relating to hours on railroads, C. 62, p. 108.

Hours of Labor: of railroad employees regulated. C. 62, p. 108.

Mines: provisions for safety in coal mines, C. 80, p. 148.

Miscellaneous: time to vote to be allowed employees, C. 15, p. 23; political opinions of employees protected, C. 63, p. 109; railroad employees may vote elsewhere than in precinct where registered, C. 73, p. 127.

Prison Labor: additional "good time" allowed certain classes of laborers, C. 53, p. 85.

Trade Disputes: "blacklisting" forbidden, C. 33, p. 62.

NEW YORK

Administration of Labor Laws: increase in number of factory inspectors, C. 158, p. 289; powers of commissioner of labor increased, C. 382, p. 738; registration of factories required, C. 335, p. 665; powers in respect to unclean factories, C. 334, p. 664; enforcement of law relating to fire drills, C. 330, p. 659; enforcement of law relating to automatic sprinklers, C. 332, p. 661; enforcement of fire prevention law, C. 329, p. 658; powers of state fire marshal increased, C. 453, p. 935; powers of bureau of fire prevention of New York City increased; C. 458, p. 974; powers of bureau of industries and immigration increased, C. 543, p. 1113; appropriation to enforce immigrant lodging-house law, C. 87, p. 154; term of factory investigating commission extended, C. 21, p. 36; appropriation for copies of report of factory investigating commission, C. 547, p. 1267.

Child Labor: hours reduced to nine a day and fifty-four a week, C. 539, p. 1102; certificate of physical fitness, C. 333, p. 662; forbidden to sell liquor, C. 264, p. 491.

Compressed-Air Work: law relating to, amended, C. 219, p. 394.

Employers' Liability and Workmen's Compensation: amendment to constitution proposed, concurrent resolution, p. 1382; leave of absence with pay for injured employees of Greater New York, C. 353, p. 697.

Factories and Workshops: washing facilities and eating in factories producing or using poisonous substances, C. 336, p. 665; fire drills in certain factories, C. 330, p. 659; automatic sprinkling systems in certain factories, C. 332, p. 661; fire prevention, C. 329, p. 658; quantity of explosives regulated, C. 453, p. 935.

Immigration: instruction of aliens and regulation of immigrant lodging places, C. 543, p. 1113; bond for license to keep immigrant lodging place, C. 337, p. 667; penalty for bureau of industries and immigration law, C. 383, p. 739.

Prison Labor: employment by conservation commission, C. 444, sec. 62, p. 897.

Unemployment: licenses of private employment agencies, C. 261, p. 487.

Woman's Work: employment for four weeks after childbirth forbidden, C. 331, p. 660; hours reduced to nine a day and fifty-four a week, C. 539, p. 1102; additional costs in actions for wages, C. 468, p. 986.

RHODE ISLAND

Accidents and Diseases: accidents to be reported by public utilities, C. 795, sec. 49, p. 112.

Child Labor: night work of messengers prohibited, C. 814, p. 172.

Employers' Liability and Workmen's Compensation: abolishing defenses and providing elective system of compensation, C. 831, p. 204.

SOUTH CAROLINA

Administration of Labor Laws: commissioner of agriculture, commerce and industries to be elected, No. 346, p. 618; charged with duty of enforcing law relating to child labor in messenger service, No. 405, p. 705.

Child Labor: in messenger service in cities of over 5,000 population, forbidden under fourteen, and night work forbidden under eighteen, No. 405, p. 705.

Unemployment: notice of shutdowns required from employers, No. 424, p. 750.

TEXAS

(No labor laws. Special Session, July 31 to August 29, 1911.)

VIRGINIA

Accidents and Diseases: coal mine accidents to be reported, C. 178, sec. 17, p. 430.

Administration of Labor Laws: department of mines created, C. 178, p. 419; appropriation, C. 137, p. 241, 259.

Child Labor: forbidden in coal mines, C. 178, sec. 15, p. 430; hours limited in workshops and mercantile establishments, C. 248, p. 557.

Employers' Liability, Workmen's Compensation, and Insurance: fellow-servant defense further limited, C. 291, p. 583; reports required of insurance companies, C. 65, p. 107.

Factories and Workshops: toilet facilities, C. 62, p. 103.

Mines: provisions for health and safety in, C. 178, p. 419.

Prison Labor: convicts to quarry and grind limestone and oyster shells, C. 295, p. 586.

Wages: time and kind of payment, C. 106, p. 188.

Woman's Work: forbidden in coal mines, C. 178, sec. 15, p. 430; hours limited in workshops and mercantile establishments, C. 248, p. 557.

WISCONSIN

(No labor laws. Special Session.)

UNITED STATES

Administration of Labor Laws: method of administering eight-hour law and appeals, C. 174, p. 137.

- Child Labor*: special investigations required of the Children's Bureau, C. 73, p. 79; appropriation for Children's Bureau, C. 350, p. 410.
- Commission on Industrial Relations*: creation, powers and duties, C. 351, p. 415.
- Employers' Liability and Workmen's Compensation*: compensation act extended to employees of the Bureau of Mines and of the Forestry Service, C. 57, p. 74; also to employees of the Lighthouse Service, C. 255, p. 239; the President given power to provide compensation system for Panama Canal employees, C. 390, p. 563.
- Factories and Workshops*: prohibitive tax placed upon the manufacture of white phosphorus matches, C. 75, p. 81.
- Hours*: all contracts to contain eight-hour provision, C. 174, p. 137; eight hours for letter carriers and clerks in first and second-class post offices, C. 389, p. 554; appropriation for the armament of fortifications to be used only for work done on eight-hour basis, C. 157, p. 127; eight hours on all navy contract work, C. 335, p. 355.
- Miscellaneous*: cash rewards to employees of the Ordnance Department for suggestions relative to improvements or economies in manufacturing, C. 236, p. 193; rewards to postal employees for inventions, C. 389, p. 545.
- Safety*: wooden mail cars to be replaced by steel, C. 389, p. 547.
- Trade Unions and Trade Disputes*: right of post-office employees to organize and trade-union publications admitted as second-class mail, C. 389, p. 550, 555.

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- No. 1: Proceedings of the First Annual Meeting, 1907.
No. 2: Proceedings of the Second Annual Meeting, 1908.
No. 3: Report of the General Administrative Council, 1909.
No. 4: (Legislative Review No. 1) Review of Labor Legislation of 1909.
No. 5: (Legislative Review No. 2) Industrial Education, 1909.
No. 6: (Legislative Review No. 3) Administration of Labor Laws, 1909.
No. 7: (Legislative Review No. 4) Woman's Work, 1909.
No. 8: (Legislative Review No. 5) Child Labor, 1910.
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Introductory Address, Henry R. Seager.
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Introductory Address, Charles Nagel.
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Introductory Address, Walter Fisher.
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**AMERICAN LABOR LEGISLATION
REVIEW**

VOL. II, No. 4
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**IMMEDIATE
LEGISLATIVE PROGRAM**

One Day of Rest in Seven.
Prevention of Lead Poisoning.
Reporting of Accidents and Diseases.
Workmen's Compensation.
Investigation of Industrial Hygiene.
Protection for Working Women.
Enforcement of Labor Laws.

DECEMBER, 1912

**AMERICAN ASSOCIATION FOR LABOR LEGISLATION
131 EAST 23d ST., NEW YORK CITY**

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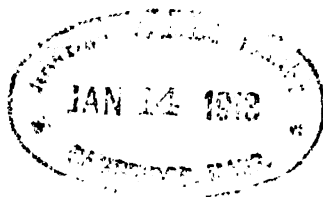
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CONTENTS

I. ONE DAY OF REST IN SEVEN.....	517
II. PROTECTION FROM LEAD POISONING.....	534
III. UNIFORM REPORTING OF ACCIDENTS AND DISEASES.....	541
IV. COMPENSATION OF FEDERAL EMPLOYEES FOR ACCIDENTS AND DISEASES.....	559
V. STATE WORKMEN'S COMPENSATION LEGISLATION.....	565
VI. INVESTIGATIONS INTO INDUSTRIAL HYGIENE AND SAFETY	568
VII. PROTECTION FOR WORKING WOMEN.....	572
VIII. FACTORY INSPECTION AND LABOR LAW ENFORCEMENT...	595

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LEGAL REQUIREMENTS FOR POLICE INSPECTOR IN THE UNITED STATES

- These five States have civil service requirements for police inspectors.
- These four States require practical experience for police inspectors:
 - Indiana: "must have ten years' experience in police work."
 - Kentucky: "practical knowledge in police work."
 - Minnesota: "practical experience in police work."
 - Ohio: "must be competent and experienced in police work."
- No civil service requirements for police inspectors.

* The State inspector of jails, almshouses, and prisons must be a physician.

INTRODUCTORY NOTE

The purpose of this number of our Review is to furnish in convenient form the most essential facts for our educational and legislative campaigns during 1918.

It is hoped that anyone wishing to speak or write on these subjects will find readily available in these pages something of value. Members of our Association who wish to write to their representatives in Congress and in state legislatures, urging active support of this program, may find here concrete information for the purpose.

It is not expected that one will find here all of the facts needed in drafting legislation, but standard bills on these subjects are already drafted and will be sent to members of the Association on request.

In order to represent conditions in graphic form, colored maps and diagrams have been used, and in order to economize space, a few statistical tables have been introduced. At the end of each section there are a few references to the most readily available reports, magazines and books on that subject. From time to time, as the legislative work progresses, supplementary leaflets and reports of a more popular nature will be distributed.

In the preparation of this material for our immediate legislative campaign, no section has been the work of a single person. Special credit is due, however, to the following volunteer workers who have contributed most generously of their time: Prof. Robert E. Chaddock, of Columbia University; Miss Frances Ecob; John A. Fitch, of *The Survey*; Solon DeLeon, of the New York School of Philanthropy; Edward F. Brown, of the National Child Labor Committee; Henry J. Harris, of the Library of Congress; and the Commissioners of Labor and Inspectors of Factories in the various states.

JOHN B. ANDREWS, Secretary,
American Association for Labor Legislation.

IMMEDIATE LEGISLATIVE PROGRAM

- 1.—Provide for one day of rest in seven, no matter how continuous the industry.
- 2.—Secure sanitary regulations for the protection of workers exposed to the dangers of lead poisoning.
- 3.—Extend the uniform reporting of industrial accidents and occupational diseases, and urge the adoption of the standard schedules for such reports.
- 4.—Secure a revision of the federal employees' compensation act, including extension of the compensation principle to embrace occupational diseases as well as industrial accidents.
- 5.—Aid in the enactment of additional state laws providing just systems of compensation or insurance against industrial injuries.
- 6.—Encourage the investigation of industrial accidents and occupational diseases by state and national authorities, and urge upon the federal government proper provision for the study and advancement of industrial hygiene and safety.
- 7.—Cooperate in securing effective legal safeguards for working women.
- 8.—Prepare for the supreme test of law enforcement by helping to develop machinery for more efficient factory inspection and better enforcement of labor laws.

ONE DAY OF REST IN SEVEN

Immediate Legislative Program: Provide for one day of rest in seven, no matter how continuous the industry.

In the outskirts of beautiful Riverside, California, where the snow-capped mountain peaks look down on the orange groves, there are cement mills in which workmen toil from week end to week end without a day of rest, except when a twenty-four hour respite is paid for by a continuous twenty-four hour period of labor.

In Buffalo a steel worker who had worked every Sunday for a year went to work one Saturday at six in the morning. He left for his home at the end of the shift at two o'clock on Sunday afternoon. On Monday morning he went to work again and stayed at work until Tuesday morning, twenty-four hours on duty.

A street-car motorman in New York left his home to go to work one Sunday last winter at noon. He had worked all of the six days immediately preceding, and the preceding Sunday, too. But nevertheless he went to work on this Sunday. When he returned to his home again after completing his day's work, it was two o'clock Monday morning. Fourteen hours the street-car company had required of him as a day's work on Sunday.

These examples are merely typical of conditions that exist in every American state. It is high time something were done about it. It is a satire on our Christian civilization that such conditions prevail.

But what is to be done? Enforce the Sunday laws? There are two reasons why relief is not to be expected from that quarter. The first is that the Sunday laws are so rent with exceptions that they now possess very little meaning, and loopholes are provided for practically every industry that wishes to operate in spite of them.

The second reason is that absolute prohibition of Sunday labor is neither practicable nor desirable. Stop all trains, all street cars, all heating and lighting plants, all delivery of milk, and all garbage removal on Sundays, and the great cities will suffer as under a pestilence. Stop the blast furnaces, smelters, and other industries which

for technical reasons require continuous operation, and those industries will be paralyzed.

Obviously the Sunday laws are unscientific in character, and do not accord with the exigencies of modern industry and life. A new type of law is needed, based on a different principle,—one that will forbid an employer to work his men seven days a week and yet permit an industry, necessarily or desirably continuous, to operate seven days a week.¹ A law requiring one day of rest in seven, regardless of which day it is, for all workmen—absolutely demanding one day of rest with no loopholes of “necessity and charity”—would result in two things. The industries necessarily continuous would be compelled to add one-seventh to their working force, and let one-seventh of their force by rotation rest each day in the week. And, because it would cost more to employ a larger force, the industries not necessarily continuous would close on Sundays.

Thus the Sabbath would be better protected than it is now; thus men would be protected from the necessity of working seven days a week in order to hold their jobs. A man who has one day of rest in seven, whether by his own choice or by compulsion, is a better worker, a better citizen, and a better man than one who labors every day.

SEVEN-DAY LABOR IN THE UNITED STATES

Knowledge of the extent of seven-day labor in the United States is still very fragmentary. Only three states—Massachusetts, Minnesota and New York—seem so far to have made any study of the question within their borders.

The following is a tentative list, according to present information, of those industries in which seven-day labor occurs. The appearance of an industry on the list does not mean that wherever that industry is carried on, or for every worker engaged in it, seven-day labor is the rule, but merely that seven-day labor has at some place or for some large group of workers been found to exist therein.

The distinction between “continuous” and “non-continuous” industries made in this list is based upon the following definition:

¹The American Association for Labor Legislation has drafted and will submit a bill for uniform state legislation providing for one day of rest in seven.

Report of the Special Commission on Hours of Labor in Continuous Industries, of the International Association for Labor Legislation (London, 1912), p. 13.¹

A continuous industry or part of an industry is one where work is carried on night and day for not less than thirty days in a year, whether or not there are short interruptions when shifts are changed or during meal times or when work is stopped at the week ends. The subdivisions of continuous industries will then be as follows:

- (1) Industries or parts of industries which are continuous (work night and day) for technical reasons:
 - (a) Industries which are absolutely continuous (i.e., work night and day, week-days, and Sundays);
 - (b) Industries which work continuously five or six days in the week and then stop at the week end.
- (2) Industries or parts of industries which are habitually continuous, not on account of technical necessity, but for reasons of economy (in order to obtain cheapness of production, or larger output, etc.), or of public necessity.

TENTATIVE LIST OF SEVEN-DAY INDUSTRIES IN THE UNITED STATES

A. CONTINUOUS INDUSTRIES

I. Domestic and Personal Service

- 1. Barber shops
- 2. Building service (watchmen, janitors, etc.)
- 3. Domestic service
- 4. Hotels and restaurants
- 5. Bootblacking

II. Manufacturing

- 1. Bakeries
- 2. Beet-sugar plants
- 3. Breweries
- 4. Cane-sugar plants
- 5. Canneries
- 6. Cement plants
- 7. Electric light and power plants
- 8. Gas works
- 9. Glass works
- 10. Ice plants
- 11. Iron and steel works
- 12. Newspaper publishing
- 13. Paper and pulp mills
- 14. Smelters

III. Professional Service

- 1. Drug stores
- 2. Libraries
- 3. Theaters and concert halls

¹ Copies of this report, including schedules for the investigation of continuous industries, may be obtained by addressing the American Association for Labor Legislation.

IV. Public Service

1. Fire department
2. Life-saving service
3. Police department
4. Street cleaning

V. Trade

1. Ice, milk, and newspaper delivery
2. Cigar, confectionery, provision and clothing stores

VI. Transportation

1. Express and messenger service
2. Livery stables and garages
3. Navigation
4. Post offices
5. Steam railroads
6. Street railroads
7. Telegraph
8. Telephone

B. NON-CONTINUOUS INDUSTRIES

I. Agriculture

1. Dairies
2. Lumbering
3. Stock farms

II. Extraction of Minerals

1. Mining

III. Manufacturing

1. Fur-goods manufacture
2. Garment trades

SEVEN-DAY LABOR IN THE IRON AND STEEL INDUSTRY

United States Labor Bureau *Report on Conditions of Employment in the Iron and Steel Industry in the United States* (1912), Vol. I:XIV-XVI. Summary, p. 8.

During May, 1910, the period covered by this investigation, 50,000, or 29 per cent, of the 173,000 employees of blast furnaces and steel works and rolling mills covered by this report [all in the United States except the Bethlehem Steel Works] customarily worked seven days per week, and 20 per cent of them worked eighty-four hours or more per week, which, in effect, means a twelve-hour working day every day in the week, including Sunday. The evil of seven-day work was particularly accentuated by the fact developed in the investigation, that the seven-day working week was not confined to the blast-furnace department where there is a metallurgical necessity for continuous operation, and in which department 88 per cent of the employees worked seven days a week; but it was also found that, to a considerable extent, in other departments where no such metallurgical necessity can be claimed, productive work was carried on on Sunday just as on other days in the week. For example, in some establishments the Bessemer converters, the open-hearth furnaces, and blooming, rail and structural mills were found operating seven days a week for commercial reasons only.

The hardship of a twelve-hour day and a seven-day week is still further increased by the fact that every week or two weeks, as the case may be, when the employees on the day shift are transferred to the night shift, and vice versa, employees remain on duty without relief either eighteen or twenty-four consecutive hours, according to the practice adopted for the change of shift. The most common plan to effect this change of shift is to work one shift of employees on the day of change through the entire twenty-four hours, the succeeding shift working the regular twelve hours when it comes on duty. In some instances the change is effected by having one shift remain on duty eighteen hours and the succeeding shift work eighteen hours. During the time that one shift is on duty, of course, the employees on the other shift have the same number of hours of relief from duty.

United States Labor Bureau Report on Conditions of Employment in the Iron and Steel Industry in the United States (1912), Vol. I:LXIII, 508. Summary, p. 57.

PER CENT OF STEEL WORKERS CUSTOMARILY
WORKING SEVEN DAYS A WEEK

Branch of Industry	Number of Employees	Per cent of employees whose ordinary working time per week was:	
		6 and 7 days alternately	7 days
Blast furnaces	31,321	0.26	87.88
Steel works and rolling mills: Bessemer converters	5,618	2.92	24.07
Open-hearth furnaces	14,618	23.90	30.20
Puddling mills and crucible furnaces	7,489	.36	1.42
Rolling mills	43,629	1.58	10.00
Tube mills	4,252	.24	1.93
Total, steel works and rolling mills	75,606	5.80	13.65
Power, mechanical and yard force	65,744	2.93	19.34
Grand total	172,671	3.70	29.28

About 3 per cent of the employees in steel foundries were found to be working seven days a week.

United States Labor Bureau Report on Strike at Bethlehem Steel Works (1910), pp. 7-15.

In January, 1910, 9,184 names appeared on the payroll [of the Bethlehem Steel Works, Bethlehem, Pa.]. Of this number 79 worked in occupations

regularly requiring 13-1/6 hours a day for the entire seven days of the week; three worked in occupations regularly requiring thirteen hours for the seven days of the week. . . . Three worked 13-3/4 hours seven days a week. Of the total employees appearing on the January payroll, 2,322 worked in occupations regularly requiring twelve hours a day for the seven days of the week.

A further analysis of the payroll of the company shows that out of 9,184 persons employed during that month, 2,628, or 29 per cent, worked regularly seven days a week. Sunday work was the rule, and was not considered overtime. . . . If the comparison be confined to those departments where Sunday work was done during the month, 57.9 per cent of all the men did Sunday work.

SEVEN-DAY LABOR IN OTHER INDUSTRIES

Report of Massachusetts Joint Special Committee on Observance of the Lord's Day. Massachusetts House Document 1160 (1907), p. 83.

ESTIMATED NUMBER OF PERSONS ENGAGED IN SEVEN-DAY LABOR IN MASSACHUSETTS

Bootblacks	1,400
Druggists	4,230
Hotels	24,000
Steam railroads	9,274
Street railroads	17,200
Bake shops	6,150
Restaurants	6,600
Publishing (papers)	175
Telephone and telegraph	1,391
Theaters	700
Janitors	3,000
Livery, garages	5,000
Railroad news companies	220
Public employees	11,000
Postal service	5,000 ¹
Personal service	125,368
Total	221,985

This represents over 7 per cent of the total population of the state.

¹ In the text (p. 82) the report states that only 50 per cent of these men are required to do seven-day labor, but the table gives the full 5,000, as above. [Ed.]

Twelfth Biennial Report of the Minnesota Bureau of Labor (1909-1910). Derived from Table D, pp. 104-119.

NUMBER OF MEN ENGAGED IN SEVEN-DAY LABOR IN MINNESOTA

Food Products:		Hospitals, colleges and other institutions		180
Bakeries	56	Hotels and restaurants	11,358	
Brewing	96	Laundry work	5	
Confectionery	32	Livery and drayage	2,221	
Creamery products and ice cream	532	Shoe shining	81	
Flour and grist mills	62	Retail Mercantile Establishments:		
Grain, cleaning and storing	2	Amusements	401	
Iron and Steel Products:		Bakery goods	11	
Autos and bicycles	95	Billiard and pool rooms and bowling alleys	153	
Blast furnaces	279	Books and stationery	2	
Paper and Pulp Products:		Clothing and gent's furnishings	19	
Paper and pulp mills	299	Confectionery and cigars	1,171	
Chemicals and Allied Products:		Dairy products	67	
Oils	377	Drug stores	1,081	
Tallow and fertilizers	4	Dry-goods and notions	6	
General Contracting:		Furniture and undertaking	25	
Public Utilities:		General merchandise	173	
Heat, light and power	2,320	Groceries	85	
Telegraph and telephone, express and messenger service	3,207	Hardware	5	
Transportation:		Ice dealers	13	
Railroads	49,166	Jewelry and optical goods	9	
Street railways	3,705	Meat markets	46	
Ferries	7	Nurseries and florists	21	
Mining Operations:		Photographers and photographic supplies	48	
Iron mining	20,678	Toys and novelties	6	
Personal Service:		Wholesale Mercantile Establishments:		
Barber shops and bath rooms	37	Commission merchants	99	
Preliminary Report of the New York State Factory Investigating Commission (1912), Vol. I: 777, 778.		Total		
		98,558		

Out of a total of 1,138,965 wage-earners in factories in New York, reported to the factory inspection bureau in 1909, 30,467 were reported as working in excess of sixty-three hours per week. This is 2.67 per cent of the total number of wage workers reported. . . . Those wage workers who worked in excess of sixty-three hours per week varied generally in the time of their weekly employment from sixty-five hours to one hundred and nineteen hours; the former indicating ten hours of regular work for six days, and a half day on Sunday; the latter indicating an average of seventeen hours per day for a full seven days per week. This latter schedule existed in a certain canning establishment. . . .

In March, 1910, the secretaries of a considerable number of labor unions in the state reported to the state bureau of labor statistics 335,814 members. Out of this total they reported 35,742 (10.6 per cent of the whole number) as working Sundays. Most of them, all but 698, worked every Sunday.

Bulletin 45, New York State Department of Labor (September, 1910). Derived from Table XII, pp. 450, 451.

NUMBER OF TRADE UNION MEMBERS IN SPECIFIED INDUSTRIES ENGAGED
IN SEVEN-DAY LABOR IN NEW YORK

Industry	Number of trade union members in specified industries who work per week		Per cent working 7 days per week
	Six days or less	Seven days	
Building and paving trades	87,207	27	0.0
Railways	839	14,765	94.6
Navigation		1,929	100.0
Teaming and cab driving	9,555	3,745	28.1
Freight handling	3,249	18	0.5
Telegraph	5	1,884	99.7
Iron and steel	25,288	23	0.0
Printing, binding, etc.	23,842	396	1.6
Food products	7,427	500	6.3
Beverages	5,065	1,707	25.2
Hotels and restaurants	2,184	1,002	31.4
Barbering	1,960	294	13.0
Public employment	7,185	6,740	48.4
Stationary engine men	1,776	2,244	55.8
Paper and paper goods	1,015	390	27.7
Other distinct trades	3,007	78	2.5
Total	179,604	35,742	19.9

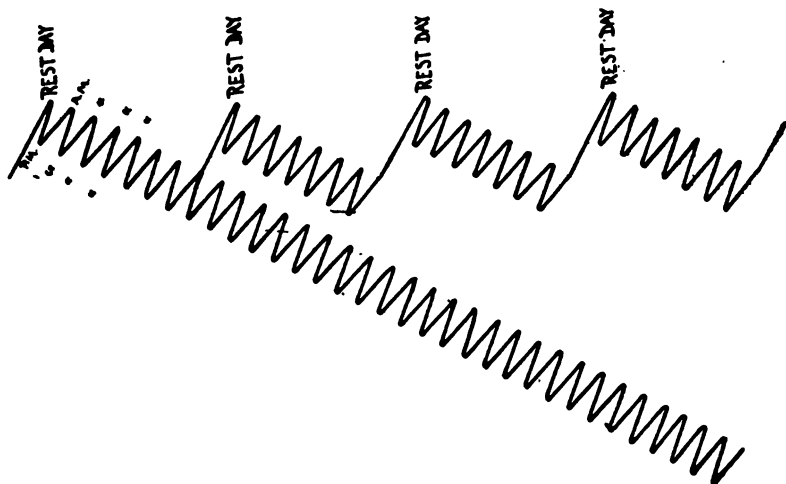
NEED OF ONE DAY'S REST IN SEVEN

Goldmark, Josephine. *Fatigue and Efficiency* (New York, 1912), pp. 9, 281.

The regulation of working hours is the necessary mechanism to prevent overfatigue or exhaustion, forerunner of countless miseries to individuals and whole nations.

The shorter workday and relief from overstrain are not in themselves the cure for the ills we have considered; but they are the *sine qua non* without which no other cure is possible or conceivable. Just because a fatigued person is a poisoned person, poisoned by the accumulation of his own waste products, nothing can fundamentally cure the exhausted worker which does not eliminate the cause of such accumulated poisoning. . . . After exhaustion has set in nothing but rest and repose permits the organism to expel its poisons from day to day.

Haegler, A., *Le Repos Hebdomadaire au Point de Vue Hygiénique*
[Weekly Rest from the Hygienic Viewpoint], Geneva, 1883, p. 5.



HAEGLER'S CHART

Fatigue curves show daily depletion of strength and nightly recuperation.

The upper line shows the effect of the weekly day of rest.

The lower line shows the gradual depression of strength with daily work and no time of rest.

*Report of Massachusetts Joint Special Committee on Observance
of the Lord's Day. Massachusetts House Document 1160
(1907), pp. 9-12.*

The committee are of one mind as to the need of a weekly day of rest for the preservation of the health and strength of the community, and would therefore recommend legislation to secure to all citizens the right of one clear day's rest in seven. In so far as possible, Sunday should be maintained as the weekly day of rest; and whenever the needs of the community, public convenience or demand compel labor on Sunday, persons thus employed should be given a legal right to rest on some other day of the week.

"If an applicant came to us for insurance, and we knew he was working seven days a week, we would refuse the risk, unless such excessive work was only temporary."—John M. Pattison, President Union Central Life Insurance Co., ex-Governor of Ohio.

"The general consensus of opinion among scientists seems to be that a day of rest, as indicated, is not only essential to hygienic living, but also advantageous from an economic point of view."—Dr. Harold Williams, Dean of Tufts College Medical School.

"It has been found upon careful investigation, and proven by experience, that the human body needs not only the rest of the night, but, in addition, one full day's rest in every seven, that it may be in the best condition. A well and strong body, that has been permitted to have the needed rest, can

ward off disease and effectually battle against its approach, while a system that has been under the strain of long hours and has been deprived of needed rest has much less power to resist disease. Hence we have the great number of sudden deaths among railroad and steamboat men, and others who are subjected to severe nervous strain and exhausting service; and diseases of various kinds are prematurely developed in many of these men, who, if the needed rest had been given, would have been well and strong."—Dr. T. T. Mutchler.

Hill, Charles. *Sunday Laws: A paper read at the Social Science Congress* (Aberdeen, 1905), p. 11.

Rest for all, the rest of one day in seven, is necessary to man's physical welfare; therefore the state should endeavor to secure such rest for all.

Earle, J. H. *The Sunday Problem* (Boston, 1894), p. 50.

"A man who is required to work seven days in a week does it to hold his place, to support himself and family, but loses self-respect, and does not have the interest in the work he would have did he respect himself and his employer."—W. J. Young, Vice-President Forest Oil Co.

Wisconsin Sunday Rest Association's Motto.

Nature's law: Rest one day in seven or suffer in thy body, thy brain, thy nerves, thy home, thy manhood, thy character, and, still more, in thy soul.

Address to the Officers and Stockholders of the Western Union Telegraph Company. International Federation of Sunday Rest Associations of America (1909).

Both experience and science demonstrate more clearly each year that those who enjoy genuine weekly rest days will have better health, clearer intellects, and hence can do more and better work each year, and retain for more years their ability to do efficient work than those who work seven days each week. Annual vacations are needed, but cannot repair the damage caused by seven days' toil per week the rest of the year.

Recent careful scientific investigations have proved that the mental and nerve force of those who engage in constant mental labor so runs down in six days that it can be restored to its normal condition only by thirty-six hours' entire cessation from their usual lines of mental strain, and that omitting such weekly rest is liable to cause insanity or mental weakness.

Massachusetts, *Twenty-ninth Annual Report of the Bureau of Statistics of Labor* (1898), pp. 61, 62.

Opinions of employers: "It is believed that every working man should have one day out of seven for rest, as they are better able in such case to perform their work satisfactorily." . . . "Every man should have one day in seven to spend with his family for rest and recreation." . . . "This firm is of the opinion that nothing is gained by Sunday work, believing that a man should have at least one day in seven for rest."

Thomas Babbington Macaulay.

While industry is suspended, while the plough lies in the furrow, while the exchange is silent, while no smoke ascends from the factory, a process is going on, quite as important to the wealth of the nation as any process which is performed on more busy days. Man, the machine of machines, is repairing and winding up, so that he returns to his labors on Monday with clearer intellect, with livelier spirits, with renewed corporeal vigor.

Document of the Executive Committee of the *International Federation for Sunday Observance* (Geneva, 1906).

At the request of English shareholders, we have investigated the consequences in Switzerland, with regard to railway accidents, of the law demanding that fifty-two days of rest a year (of which seventeen shall be Sundays) shall be granted to railway employees. It follows from an abundance of figures furnished by our federal department of railways during a period of nearly twelve years, before the application of the law and afterwards, from 1888 to 1901, that under the rule of fifty-two days of rest the accidents due to the fault of the employees have diminished by 58 per cent; those due to all causes, by 73 per cent. Of bodily injuries 72 per cent have been prevented. There would be a decrease of 135 per cent in the number of deaths resulting from collisions. On the basis of distance in kilometers, there would be 94 per cent fewer accidents of all natures. As the average of these five computations united is 86 per cent, this sum total appears to us to explain how much the conditions of employment have been improved. Although this can be attributed in part to technical improvements, we are persuaded that the law regarding the fifty-two days of rest must have a very great influence over the excellent result obtained.

POSSIBILITY OF ABOLISHING SEVEN-DAY LABOR

Massachusetts, *Twenty-ninth Annual Report of the Bureau of Statistics of Labor*, 1898, p. 35.

Under present conditions, it is impossible for all the [railway] men who desire a day of rest during the week in lieu of Sunday to obtain it, even without pay. It would be possible, however, to provide such a day of rest for all by a different arrangement of time tables and an increased number of employees on the "extra" or waiting list.

United States Labor Bureau *Report on Conditions of Employment in the Iron and Steel Industry in the United States* (1912), Vol. I:XIV-XVI, LXII. Summary, pp. 8-9, 56.

That much of the Sunday labor which has been prevalent in the steel industry is no more necessary than in other industries is shown conclusively

by the fact that at the time of the investigation made in 1910 by this bureau into the conditions of labor in the Bethlehem Steel Works, the president of the Steel Corporation directed the rigid enforcement of a resolution adopted three years previous, cutting out a large part of Sunday work except in the blast-furnace department. Even in the blast-furnace department, where there is a metallurgical necessity for continuous operation day and night throughout seven days of the week, there is practically nothing except the desire to economize in the expense of production that has prevented the introduction of a system that would give each employee one day of rest out of the seven.

Since the beginning of the present investigation, however, this matter of abolishing seven-day work for the individual employees in the blast furnaces as well as in other departments of the industry, has received the attention of the American Iron and Steel Institute, and through a committee of that organization a plan has been proposed which gives each employee one day of rest each week. A number of the plants throughout the country have, at the instance of the institute, adopted this plan or some modification of it, and have successfully operated it for several months. A thorough discussion of these plans and of their value in solving the problem to which they are applied will be found in the volume dealing with the general conditions of labor in the industry.

ABORTIVE ONE DAY REST LAWS IN THE UNITED STATES

This table includes only laws which require one day of rest in seven, regardless of the day, for adult workers. The New Jersey law limiting the work week to six days for women, the New York measure which does the same for women, children and male minors under the age of eighteen years, and the ordinary Sunday closing and Sunday rest laws which in continuous industries are impracticable and unenforceable, are not included. Of the seven laws here listed, two have been judicially stricken from the statute books. Most of these laws are weak, and visibly the result of sporadic agitation and unintelligent bill-drafting. Note the Massachusetts clause which exempts from prohibition all seven-day labor "at the request of the employee".

State	Employments Covered	Exemptions	Period of Rest	Enforcing Authority and Penalty
California Penal Code 1906, p. 722.	"Any occupation of labor".	"Any case of emergency."	Twenty-four hours.	Enforced by the commissioners of the Bureau of Labor Statistics. Penalty \$20-\$50, or not over 60 days' imprisonment, or both.
Codes 1906, Act No. 2665, amended by Laws 1907, C. 224.	"Any store, establishment or place of business, where and in which drugs and medicines are sold at retail, and where and in which physicians' prescriptions are compounded."	"Answering of and attending to emergency calls."	Work not to be required or permitted "for more than an average of ten hours a day or sixty hours a week of six consecutive calendar days."	Violation is a misdemeanor.

ABORTIVE ONE DAY REST LAWS IN THE UNITED STATES.—Cont.

State	Employments Covered	Exemptions	Period of Rest	Enforcing Authority and Penalty
Connecticut Acts 1911, C. 162.	"Any commercial occupation or . . . any industrial process."	"Cases of emergency . . . farm or . . . personal service . . . druggists, watchmen, superintendents, managers, janitors . . . persons engaged solely in transportation . . . sale or delivery of milk, food, or newspapers . . . such commercial occupations or industrial processes as by their nature are required to be continuous . . . necessary work of inspection, repair or care of any manufacturing or other plant or of any merchandise or stock on Sunday."	"One full regular working day."	"Not more than \$200 for each offense."
Massachusetts Acts 1909, C. 514, sec. 52.	"Any commercial occupation, or . . . the work of any industrial process, or . . . the work of transportation or communication."	"Cases of emergency or at the request of the employee." "Farm or personal service, druggists, watchmen, superintendents or managers, janitors, or persons engaged in the transportation, sale or delivery of milk, food or newspapers."	Twenty-four consecutive hours.	Enforced by the inspection department of the District Police; after June 1, 1913, by the State Board of Labor and Industries. Maximum penalty \$50.
Missouri Laws 1909, p. 864. Declared unconstitutional by the Supreme Court of Missouri, Feb. 12, 1910. State v. Mikaicek, 125 S. W. 507.	"Any biscuit, bread, pastry or cake bakery, or confectionery establishment."	None.	Twenty-four hours.	Enforcement assigned to the factory inspector or his deputy. Penalty \$10-\$100.
New York Consolidated Laws 1909, Public Health Law, sec. 236.	"Pharmacist or drug clerk employed in any pharmacy or drug store."	None.	"At least one full day off in two consecutive weeks."	Enforced by the State Board of Pharmacy. Violation is a misdemeanor.
Pennsylvania Digest, p. 62. Declared meaningless and void by a county court in 1898. 20 Pa. Co. C. Rep. 503.	Bakers and confectioners.		One day in seven (by implication).	
Wisconsin Laws 1909, sec. 1729a -10.	"Fire departments in all cities of the second or third class . . . having a population of thirty thousand or more."	None.	Twenty-four hours.	Administration left to chiefs of fire departments; enforced by complaints to district attorneys.

LEGISLATION IN FOREIGN COUNTRIES

Since 1905, laws on one day of rest in seven have been enacted or decrees issued by government ministers in Argentine Republic, Austria, Bosnia and Herzegovina, Belgium, British India, Canada, Cape of Good Hope, Chili, Denmark, France, Germany, Italy, Portugal, Roumania, Spain and Switzerland, putting into more or less general application the principle of weekly periods of rest.

John A. Fitch, *The Survey*, April 17, 1909, p. 134.

Most of these laws make Sunday the general rest day, but when for reasons specified in the laws, work must go on during Sunday, a period of rest, usually twenty-four hours, is required on some other day in the week. In France, Italy, and Canada, these laws are made to include practically every industry. In the other countries they are limited somewhat, to industries or to territorial districts.

RESOLUTIONS FAVORING ONE DAY OF REST IN SEVEN

Proceedings, Fifth Annual Meeting, American Association for Labor Legislation (1911). *American Labor Legislation Review*, Vol. II., No. 1, pp. 155-156.

Whereas the number of industries that are kept in continuous operation and the number of wage-earners who are regularly employed every day in the week in such industries have greatly increased in recent years;

Whereas the so-called Sunday Laws enacted in the first instance to protect the Sabbath from desecration have not only, in the turmoil and rush of modern industrial conditions, failed to do that, but have also signally failed in protecting men from the debasing effects of continuous seven-day toil;

Whereas regular employment for eight hours or more a day on all seven days of the week tends to undermine the health, dwarf the minds and debase the morals of those engaged in it, by depriving them of the opportunity for reasonable rest, relaxation and enjoyment with family and friends, which is craved by every normal person; and

Whereas several large companies have found it practicable to adopt a system allowing one day's rest in seven to all employees in continuous processes; Therefore be it

Resolved, That this Association favors, and pledges itself to support legislation that will serve to protect industrial workers from being required or permitted to work regularly seven days in any week, and be it further

Resolved, That the president of this Association be directed to appoint a committee of five or more persons to draft a bill designed to accomplish this object, and that an earnest effort be made to secure the enactment of this bill into law in the several states.

In accordance with this resolution the following committee was appointed:

Committee on One Day of Rest in Seven: Mr. John Fitch, Rev. Charles Macfarland, Mr. Charles M. Cabot, Mr. Louis Brandeis, Professor Ernst Freund, Mr. William D. Mahon.

Social Standards for Industry: A Platform. National Conference of Charities and Corrections (Cleveland, 1912), p. 13.

Six-day week.—The work period limited to six days in each week; and a period of rest of forty consecutive hours in each week.

Letter to Presidents of all Constituent Companies. Elbridge H. Gary, president U. S. Steel Corporation (March 18, 1910).

I emphasize the fact that there should be at least twenty-four continuous hours' interval during each week in the production of ingots.

Massachusetts, Twenty-ninth Annual Report of the Bureau of Statistics of Labor (1898), p. 95.

While it is recognized that certain work must be done on Sunday, and that under modern conceptions of life other work is justified by custom, which in effect has the force of necessity, it is believed that at least one day's rest in every seven, if not upon Sunday then upon some other day, belongs to the workingman, and that industries and employment should be organized upon this basis.

Federal Council of the Churches of Christ in America: The Church and Modern Industry, Report and Resolutions, pp. 17-18; *The Church's Appeal in Behalf of Labor; Report of Special Committee Concerning the Industrial Situation at South Bethlehem, Pa.*, N. Y., 1910, p. 15.

We deem it the duty of all Christian people to concern themselves directly with certain practical industrial problems. To us it seems that the churches must stand for a release from employment one day in seven.

The Commission on the Church and Social Service of the Federal Council of the Churches of Christ in America . . . urges upon all Christian churches officially, through their pulpits, their brotherhoods, and various other organizations, to emphasize and bring home to their members . . . that it is the right of every man to have one day out of the seven for rest and recreation of body, soul and mind, and that it is the obligation of every Christian employer so to arrange his business that each of the employees may have one day holiday in seven, without diminution in wages. The normal holiday is the Christian Sabbath, the Lord's Day, but where the conditions of industry or service require continuance of work seven days and the consequent employment of some part of the employees on the Lord's Day, then those so employed are entitled to receive a holiday on some other day in the week. . . .

A twelve-hour day and a seven-day week are alike a disgrace to civilization. . . . There should be laws requiring three shifts in all industries operat-

ing twenty-four hours a day, and there should be laws requiring one day of rest in seven for all workmen in seven-day industries.

Methodist Federation for Social Service.

Reduction [of hours] to the lowest practical point. One day rest in seven.

Board of Home Missions, Presbyterian Church.

We hold that the church ought to declare for the release of every worker from work one day in seven, . . . for such ordering of the hours and requirements of labor as to make them compatible with healthy physical, mental and moral life.

Pamphlet of the *Federation of Churches and Christian Organizations in New York City*, Law Enactment and Law Enforcement Bureau, Hon. George B. Agnew, Chairman (1912), p. 6.

Since January, 1911, the Federation's Law Enactment and Law Enforcement Committee has opposed or advocated, at Albany, many measures affecting the housing, health, educational, economic, recreational, neighborhood and civic conditions of the city, and affecting children, immigrants and other special groups. . . . It has opposed, for example, legislation tending to break down the weekly rest day, and **advocated a law which would secure twenty-four consecutive hours' rest, weekly, to every worker.** . . . Concerning the propriety of federative effort to free the laborers of New York from the slavery of seven-day toil per week for six-day wages there should be no question.

American Federation of Labor, Industrial Platform.

Release from employment one day in seven.

Proceedings of the Washington State Federation of Labor, 1911, p. 90.

Whereas a very large percentage of the toilers of this state are compelled to labor seven days a week by reason of the fact that their vocations are exempt from the provisions of the Sunday closing act; and

Whereas we deem it absolutely essential for the best interest of this commonwealth that no person should be compelled to labor more than six days in one week; and

Whereas we deem it but just and humane that at least one day a week should be conceded to all persons; Therefore be it

Resolved, That this federation convention use its best influence to bring about the enactment of a law covering this much-needed reform.

Massachusetts, *Twenty-ninth Annual Report of the Bureau of Statistics of Labor* (1898), p. 34.

The large organizations representing steam-railway employees have at various times in the past stated their position by resolutions favoring such

an arrangement of their work as should prevent Sunday work or provide one day's rest in every seven. Among these are the Telegraphers (25,000; Toronto, 1893), Trainmen (31,000; Boston, 1893), Locomotive Engineers (35,000; Atlanta, 1892); and the National Order of Railway Conductors (22,000; Toledo, 1893).

Progressive Party, National Platform (1912).

We pledge ourselves to work unceasingly in state and nation for: One day's rest in seven for all wage workers.

Socialist Party, National Platform (1912).

The conservation of human resources, particularly of the lives and well-being of the workers and their families: By securing to every worker a rest period of not less than a day and a half in each week.

IN A NUTSHELL

1. Seven-day labor is bad for the worker, and it is a suicidal policy for the state.
2. Most seven-day labor is unnecessary.
3. Other countries have legislated against it.
4. "Sunday laws", because unscientific and impractical, have failed.
5. One day of rest in seven is the only effective method of preventing seven-day labor.
6. It is admitted by employers to be "reasonable and fair."
7. Therefore, a law requiring one day of rest in seven, no matter how continuous the industry, is the real remedy.

References: Among the most important references on the subject of one day of rest in seven that are readily available are: *Report on Conditions of Employment in the Iron and Steel Industry in the United States*, United States Bureau of Labor (Washington, D. C., 1912); *Report on Strike at the Bethlehem Steel Works*, United States Bureau of Labor (Washington, D. C., 1910); *Twenty-ninth Annual Report of the Massachusetts Bureau of Statistics of Labor* (Boston, 1899); *Massachusetts House Document No. 1160* (Boston, 1907); *Twelfth Biennial Report of the Minnesota Bureau of Labor* (Minneapolis, 1910); *New York State Department of Labor, Bulletins Nos. 45 and 49* (Albany, September, 1910, and December, 1911); Miss Josephine Goldmark's *Fatigue and Efficiency* (Charities Publication Committee, New York, 1912); and Mr. John A. Fitch's *The Steel Workers; The Pittsburgh Survey* (Charities Publication Committee, New York, 1911). For foreign legislation on the subject, see the *Bulletin of the International Labor Office*, English edition, Vol. I, pp. 185, 387, 450; Vol. II, p. 288; Vol. III, pp. 101, 113, 124; distributed by the American Association for Labor Legislation.

PROTECTION FROM LEAD POISONING

Immediate Legislative Program: Secure sanitary regulations for the protection of workers exposed to the dangers of lead poisoning.

THE MENACE OF LEAD

Lead is a poison.

There is nothing new in this statement. It has been common knowledge for over two thousand years. Hippocrates and Dioscorides wrote concerning it. Pliny deplored the "slaves' disease" of those compelled to make basic carbonate for paint.

But we of to-day cannot, like them, dismiss lead with one or two indictments of its danger. We must recognize the fact that it is the most important of industrial poisons. We must realize that it is employed in some essential form in nearly one hundred and fifty trades, and that consequently thousands of workers are daily exposed to its influence and thereby run the risk, not only of disability, but even of death.

POISONING FROM LEAD FUMES

From these facts there is no escape. As we survey the field of American labor the menace of lead meets us on every hand. Its poisonous fumes pursue, not only the men in our lead and zinc smelters, but also the brass molders, the workers in typographical trades, and the makers of pipes, wire, sheet metal, solder, shot, and all the innumerable objects formed from metallic lead.

The hospital records of fatal cases from this fume poisoning are not pleasant reading. R— H—, who died at the age of 40 as a result of carrying molten lead from the furnace to the molds, "went quick". W— R—, who died at the age of 18 from exposure in a factory making tin cans and pails, "graduated from the public schools a big, strong boy, weighing one hundred and sixty-five pounds." J— H— B—, who died at the age of 49 from acute

lead mania, had charge of melting and casting the plates in a newspaper stereotyping room. F—— V—— B——, who died at the age of 28, was a job-printer, and therefore exposed to the further risk of handling the poisonous dust which forms on the surface of lead that has been cast and hardened. J—— J—— I——, who died at the age of 49 of "cerebral hemorrhage, chronic lead poisoning and albuminuria", worked as a compositor on a New York City paper.

There are too many such cases for quotation here, but it is the so-called "salts" of lead which claim an unenviable distinction in the number of their victims.

POISONING FROM LEAD SALTS

The poisonous dust from sugar of lead, for example, may be breathed by those engaged in the making of sanitary supplies and of colors for textiles, and by those working in dry-color houses. The yet more deadly red-lead and litharge dust not only offer their risk to all those found in red-lead factories, dry-color paint houses and storage-battery works, but also enter into the glaze of potteries, enameled signs, sanitary supplies and the making of rubber. Chrome yellow and green are used for painting, for dyeing textiles, in dry-color and paint houses and in artificial flowers and wall-papers. Enormous quantities of arsenate of lead are needed to protect plant life from the ravages of insects. Sublimed blue lead and the sulphate force their especial risks on the producer, while the basic carbonate, or white lead (the most important lead salt from a commercial standpoint), threatens the worker in so many trades that it is impossible to enumerate its uses, beyond a reference to its employment in pottery glazes, enamels, wall-papers, textiles, and dry-color and paint factories.

Sometimes the victims of lead-salt dust, as well as of fumes, "go quick". J—— S—— had only worked for six months in a white-lead factory before developing acute and fatal lead poisoning. B—— McB—— was a barrel-packer in a white-lead works for but seven months previous to death. A—— K—— had worked but four months in a storage-battery works, and J—— R—— less than a year. Men have developed palsy at the end of even a week's exposure to white lead. Dr. Alice Hamilton found a case of colic and neuritis

at the end of three days' employment; eight cases where the patient had sickened in less than two weeks' time, thirty-six in less than a month, and eighty-seven in less than a year. Thirty-four mixers and grinders of enamel averaged a little over six months' employment before symptoms of poisoning developed; and a painter, working indoors and sandpapering dry paint, fell in convulsions at the end of nine weeks, was unconscious for three days, and incapacitated for three months.

The chronic cases are hardly less painful reading. A— W—, who died at the age of 39 leaving a widow and three children, had been a letterer and striper in car shops for several years. J— O—, who died at the age of 26 of "respiratory paralysis and cardiac failure", was a house painter by trade. So was D— R—, aged 38, who came to this country from Italy but three years previous to his death. R— C—, only 22, did fine frescoing and interior work and also painted on glass. S— K—, who died at 22 of "chronic plumbism and acute endocarditis", had been a painter for eight years before his fatal seizure.

RESULTS OF IGNORING THE LEAD MENACE

There is apparently no end to the list of such cases. Probably every hospital in the country can contribute its share. One in St. Louis offered ninety-two cases in two years. Five in Philadelphia treated ninety-seven cases inside of sixteen months. Chicago, Cincinnati, Omaha, Joplin, Pittsburgh, Perth Amboy, Camden, Brooklyn, Staten Island, East Liverpool, Zanesville, Trenton, Louisville and Milwaukee swell the record of physical misery until the investigator is appalled. Bear in mind that while lead poisoning is endemic in these centers, *it exists sporadically in every community of the United States*. Bear in mind that some of the largest companies doing an industrial insurance business refuse to accept lead workers. Bear in mind, also, that no other disease which is at once so serious and so controllable, is to-day practically ignored by the medical profession throughout the country, as well as by our legislators.

This is not the case elsewhere. Great Britain has appointed costly commissions to investigate the causes and remedies for indus-

trial plumbism. Drastic laws have been enacted in that country, in Germany, the Netherlands, Belgium, Switzerland, and Denmark. After 1915, France proposes to prohibit the use of harmful lead salts within her borders. The necessity for the sanitary control of the lead trades is familiar to all foreign legislative bodies.

Unfortunately, American indifference does not imply freedom from plumbism in our industries. On the contrary, all the data available indicate that we have more, not less, than prevails in corresponding trades in Germany and Great Britain. Dr. Alice Hamilton, in *Bulletin No. 95* of the United States Bureau of Labor, shatters our illusions as to superior methods of manufacture, excellence of factory construction, better health of our working classes, and higher wages (measured by the present cost of living). Her discovery of three hundred and ninety-eight specific cases of lead poisoning among the workers in twenty-two of our twenty-five white-lead factories, with sixteen fatal cases, between January 1, 1910 and April 30, 1911, has been followed by other disclosures no less startling. In the same bulletin Dr. John B. Andrews gives a list of sixty fatal cases of lead poisoning reported by physicians for the state of New York during 1909 and 1910. A hasty study of plumbism in New York City showed three hundred and seventy-six cases during 1909, 1910 and 1911. The Illinois commission during 1908 to 1910 credits five hundred and seventy-eight cases to that state alone. The first monthly medical examination of the four hundred and fifty-three painters employed in a certain car works (which now has a clean bill of health) showed seventy-seven well-developed cases of "leading". Four physicians in Milwaukee reported one hundred and five cases of poisoning. Bear in mind that these figures are only suggestive. Germany has calculated that hospital records cover only a quarter of even the severe cases. We have as yet little data in regard to the lead workers who, often ignorant of the real cause of their sufferings, apply to dispensaries or general practitioners for aid.

But it is only by a comparison of the known morbidity in a few American lead trades with similar reports from abroad that we can realize what absence of state sanitary control means to our workers.

RELATION OF LEGISLATION TO PLUMBISM

European

White-lead factory in Dusseldorf employs 150 men; examining physician reports 2 cases for 1910.

English white and red-lead factory employs 90 men; no case of poisoning in five successive years.

English white-lead works employs 182 men; no case for 1911.

Government factory inspection in English Staffordshire potteries reports 13 cases of poisoning among 786 male dippers.

American

American white-lead factory employs 142 men; 25 cases sent to the doctor in 1910.

American white and red-lead factory employs 85 men; doctors' records for six months show 35 men "leaded".

American white-lead factory employs 170 men; 60 cases for 1911.

American local dippers' union reports that 13 men, out of a local of 85 dippers, had 16 attacks of lead poisoning.

LEAD POISONING PRACTICALLY UNNECESSARY

These figures confirm the fact, which is already too well established elsewhere to need further proof, that lead poisoning is practically unnecessary. If the real causes of our record of deaths from phthisis, apoplexy, meningitis, diseases of the blood-vessels, rheumatism, paralysis, dropsy, and affections of the urinary organs,—all of which may result from acute or chronic plumbism,—were once understood, the public would demand effective laws to remove this stigma of inhumanity from our national reputation. For lead poisoning is largely the result of lack of factory, or personal, hygiene; cleanliness either banishes it, or reduces it to little more than an ordinary trade risk.

Lead can only enter the body through the respiratory organs, the alimentary canal or, in a very minor degree, the skin. It is almost always breathed in the form of fume or dust, or eaten in food contaminated by dusty or paint-smeared hands. Sometimes the worker himself is careless; but usually he is subjected by his employer to risks he cannot avoid, and of whose danger he is ignorant. It is the infinitesimal daily dose which produces the most disastrous effects upon the human system, and this fact frequently gives a feeling of false security to both foremen and laborers. Day by day the organs

of the body strive to eliminate the lead, as fast as it is absorbed, through the ordinary channels of excretion; but when the system has become impregnated there comes a convulsive effort to get rid of the poison, and an agonizing form of colic or acute brain symptoms develop, which may leave the victim of even a few weeks' exposure a wreck.

The usual warning of chronic lead poisoning is a blue line on the gums near the teeth; the first symptoms are loss of appetite, indigestion, headache, constipation, extraordinary pallor (for lead reduces the red blood corpuscles from 30 to 50 per cent), loss of weight and muscular force, and gouty or rheumatic pains. Then ensues a slow starvation of the liver, kidneys and heart. Abnormal blood pressure develops; and frequently paralysis of wrists and ankles, or of the whole body, ensues. When the brain is affected, epileptic attacks, violent insanity, and fatal convulsions may occur. *Hundreds of victims are to-day experiencing this needless suffering in enlightened America, as the result of our lack of laws similar to those now in force in England and on the continent of Europe.*

NO EXCUSE FOR IGNORANCE OR INDIFFERENCE

One state, however, Illinois, is already proving that what has been done for the lead worker abroad, may be duplicated here. The control of fume and dust is being undertaken in all her lead trades; for the investigators of her commission discovered that conditions in these industries were intolerably bad. They proved also that, given the same or frequently worse methods of handling lead products than those formerly in vogue across the water, the worker experiences the same physical suffering that has appealed to the pity and good sense of other governments. After the Illinois report, and the reports of the United States Bureau of Labor, there is no justification for further ignorance and indifference on the part of our legislatures.

It is not a question of costly experiments to discover substitutes for lead. No long investigations of remedies are called for. The whole book of foreign experience, and the recent achievements in one of our own states, are open to us. The menace of lead can be met, and must be met, as simply and as effectively as in London, Berlin, or Chicago. For cleanliness goes far toward banishing lead poisoning,—cleanliness in the plants offering either lead-fume or lead-

dust risk to their employees, and personal cleanliness on the part of the workers. The remedy is as simple as the evils it will combat are complex. No factory, smelter or workshop in the lead trades should be other than sanitary. And a system of shop discipline should be evolved which would make it impossible for a man to eat at noon with unwashed hands, or in any place about the factory but in the lunch-room; or to leave unwashed at night in the same clothes he has worn while at work.

The manufacturer or smelter owner can practically eliminate fume and lead-dust risk by the use of hoods and exhausts, and by enclosed machinery. The largest white-lead firm in this country announces that it is now ready to waive its patent rights, and to furnish drawings and advice as to the installation of the most approved machinery for dust control in the production and handling of lead salts. All of the more progressive employers in the lead trades desire to do a clean business. We have white-lead and oxide plants which can help to solve all problems as to the safeguarding of the worker.

But while there are a few employers who desire the reform of the lead trades, there are many whom nothing but the law can ever force to a recognition of their responsibilities. For the protection, therefore, of those who are endeavoring to do their duty, and for the restraint of those who are ready to sacrifice the health and lives of their workers for the sake of personal profit, state sanitary laws for the control of the lead trades are imperatively demanded, and should be passed without delay.¹

References: Among the most important references on the subject of industrial lead poisoning that are readily available are: *Bulletin of the (United States) Bureau of Labor*, No. 95, July, 1911 (Washington, D. C.), which contains articles by Sir Thomas Oliver on "Industrial Lead Poisoning" (pp. 1-188), by Dr. Alice Hamilton on the "White Lead Industry in the United States" (pp. 189-259), and by Dr. John B. Andrews on "Deaths from Industrial Lead Poisoning (actually reported) in New York State in 1909 and 1910" (pp. 260-282); Dr. Alice Hamilton's report on lead poisoning in the *Report of the Illinois Commission on Occupational Diseases*, January, 1911 (pp. 21-49), and her pamphlet on *Lead Poisoning in the Light of Recent Studies*; Dr. Edward E. Pratt's report on lead poisoning in the City of New York in the *Preliminary Report of the New York Factory Investigating Commission*, 1912, Appendix VI (pp. 365-569); and Sir Thomas Oliver's *Dangerous Trades and Diseases of Occupation*.

¹The Association for Labor Legislation will submit the draft of a bill for uniform state legislation on this subject.

UNIFORM REPORTING OF ACCIDENTS AND DISEASES

Immediate Legislative Program: Extend the uniform reporting of industrial accidents and occupational diseases, and urge the adoption of the standard schedules for such reports.

Modern industrial prosperity has been achieved at the expense of the lives and health of the workers. The community is at last pausing to count the human costs of progress.

The facts, as we gather them, are astonishing. A working population somewhat less than half that of Lawrence, Massachusetts, is fatally injured every year, to which must be added the number of those whose injuries are not fatal,—a city almost half the size of Greater New York.¹

Meanwhile recent investigations² and more complete scientific knowledge have revealed another industrial problem of great importance to the individual and the community, the problem of occupational diseases. The results of these special inquiries suggest that many lives, both of children and of adults, and much ill-health, inefficiency, and misery, are chargeable to certain trades, which are dangerous to health. All these facts are arousing public opinion to demand the cause of this waste of life and energy and to condemn an industrial policy which places profits above human welfare and makes wealth of greater importance than human personality.

The mere loss of life and health of the injured is serious enough, but society is beginning to realize that there are far more important consequences which affect future as well as present generations. The loss of earnings or earning capacity means a lowered standard

¹ *Bulletin of the (U. S.) Bureau of Labor*, No. 78, p. 458.

² Sir Thomas Oliver, *Dangerous Trades and Diseases of Occupation*; Report of the *Commission on Occupational Diseases* (Illinois, 1911); E. E. Pratt, "Occupational Diseases", *Preliminary Report of the New York Factory Investigating Commission* (1912); *American Labor Legislation Review*, Vol. II, No. 2, June, 1912; *Bulletins of the (U. S.) Bureau of Labor*, Nos. 75, 79, 86, 95, 100.

of life for the individual or for those dependent upon him; it means food and clothing of poorer quality, less healthful lodgings, and children made prematurely old because the responsibilities of adults are placed upon young shoulders; it means that opportunity for education is denied, and chance for advancement curtailed. Professor H. R. Seager in his book, *Social Insurance*, makes the conservative estimate that 15,000 widows and 45,000 children every year must accustom themselves to a hand-to-mouth existence because of accidents in industry. Investigations into the causes of backwardness among school children show that it is due in part to home conditions which are fundamentally connected with low incomes. One important cause of low incomes of families is the loss or lowered earning capacity of the chief breadwinner through accident or disease.

Public opinion is at last being educated to demand that this waste of life and efficiency be as far as possible prevented. State legislatures have been unusually active during the past two or three years in authorizing commissions to investigate industrial accidents and their results with a view to the formulation of plans of insurance and compensation. The efforts of some twenty such commissions in as many different states to gather and analyze the facts have emphasized the incompleteness and lack of uniformity in the data which are available. As a result, the last two years have been marked by distinct advances in legislation, the object of which has been to secure more complete information concerning industrial accidents. During 1911 thirteen states³ passed such legislation, and during 1912 seven states enacted new or strengthened old laws relating to the reporting of accidents.⁴ Meanwhile, the same realization of lack of adequate data on which to base protective measures led six states in 1911, for the first time in the United States, to pass legislation requiring physicians to report cases of certain occupational diseases. During 1912 two more states enacted similar laws.⁵

This action has come as a direct result of the awakening of a public demand for the prevention of industrial accidents and occupational diseases. For how can we know where prevention must

³ *American Labor Legislation Review*, Vol. I, No. 3, October, 1911, p. 7.

⁴ *American Labor Legislation Review*, Vol. II, No. 3, October, 1912, p. 425.

⁵ See table, next page.

MAIN PROVISIONS OF EXISTING LAWS RELATIVE TO REPORTING OF OCCUPATIONAL DISEASES.*

The analysis of the six laws of 1911 is in the smaller type.
The analysis of the two laws of 1912 is in the larger type.

STATE	DISEASES TO BE REPORTED	REPORTS TO INCLUDE	TO WHOM TO REPORT	PENALTY
California Ch. 485, Laws 1911. Approved April 21. In effect, June 20, 1911.	Anthrax, compressed air illness, and poisoning from lead, phosphorus, arsenic or mercury, or their compounds.	Name and full postal address and place of employment of the patient, and the disease.	State Board of Health, and thereby transmitted to the State Commissioner of Labor.	Not more than \$10.
Connecticut Ch. 159, Acts 1911. Approved July 18. In effect, Sept. 1, 1911.	Same as California.	Same as California.	State Commissioner of Labor.	None.
Illinois H. B. 250, Laws 1911. Approved May 25, 1911. In effect, July 1, 1911.	Law is obscure, but apparently includes poisoning from "sugar of lead, white lead, lead chromate, litharge, red lead, arsenate of lead or paris green," and "the manufacture of brass or the smelting of lead or zinc."	Name, address, sex and age of employee; name of employer and last place of employment; nature, probable extent and duration of the disease.	State Board of Health, and thereby transmitted to State Department of Factory Inspection.	First offense, \$10 to \$100; subsequent offense, \$50 to \$200.
Maryland Ch. 165, Laws 1912. Approved Apr. 8. In effect, Apr. 8, 1912.	Same as California, (and "any other ailment or disease contracted as a result of the nature of the patient's employment").	Same as California, ("and the nature of the occupation," and ... "with such other specific information as may be required by the State Board of Health").	Same as California.	Same as California.
Michigan No. 119, Acts 1911. Approved April 25. In effect, Aug. 1, 1911.	Same as California.	Same as California, (and "the length of time of such employment").	Same as California.	Not more than \$50.
New Jersey Ch. 351, Laws 1912. Approved Apr. 1. In effect, July 4, 1912.	Same as California.	Same as Maryland.	Same as California.	For each offense, \$25.
New York Ch. 258, Laws 1911. Approved June 6. In effect, Sept. 1, 1911.	Same as California.	Same as California, ("with such other and further information as may be required by the Commissioner of Labor").	State Commissioner of Labor.	Same as California.
Wisconsin Ch. 252, Laws 1911. Approved June 2. In effect, June 5, 1911.	Same as California, (except that "anthrax" is omitted).	Same as California.	State Board of Health.	Same as California.

*In all states except Illinois the obligation to report falls upon every medical practitioner or physician; in Illinois, upon any physician making the required monthly examination of employees in certain specified industries. In all states except California and Connecticut where a fee of fifty cents is allowed, no compensation for reports is paid by the state.

begin until we know the facts and analyze them, until we make clear the causes?

INADEQUACY OF EXISTING LEGISLATION

Much, however, remains to be done. At the present time less than half the states collect any statistics of industrial accidents, and only eight collect statistics of industrial diseases. The statistics collected, moreover, vary greatly in completeness. Some states collect regularly, as required by law, only the record of injuries in mines; others collect only the record of accidents in factories; and most states fail to collect statistics for all industries.

1. *Failure to cover all dangerous occupations.*—One of the most serious criticisms, indeed, especially of our accident statistics, is that they do not cover all dangerous occupations. The great industrial state of Pennsylvania, for example, has no adequate system of reporting accidents except in the one important industry of coal mining. The bureau of industrial statistics receives some data, but there is no legal compulsion and the particulars are not given in detail even when the accidents are reported. Mining accidents are reported to a separate department of mines and a separate report is issued. In New York the law of 1910 extended the list of occupations in which accidents must be reported to include "building construction, excavating, and engineering work." During the first four months of its operation 2,530 accidents were reported, seventy-five of which were fatal. Still New York excuses from reporting several more or less dangerous occupations,—for example, agriculture, water transportation, teaming, and stevedoring. In the liability commission's first report⁶ it was estimated, after a careful examination of the cards of coroners' inquests and the records of emergency hospitals, that not more than half of the accidents of employment were, at that time, reported to state departments.

Most states at present require reports of accidents in only part of their dangerous occupations; but as more states adopt compensation schemes it will result in more complete records. In recent legislation there seems to be a tendency to require the notification of practically all accidents rather than merely of serious or fatal ones. Supplementary reports are also being required in more states, after

⁶ *First Report of the New York Employers' Liability Commission*, p. 28.

a certain period has expired, in order to find out the length of disability and its nature, the loss of earning power and the consequent burden. In Massachusetts and New Jersey the new laws require all employers, instead of only certain employers, to report serious accidents. In California all employers except those engaged in agriculture and those employing domestic labor are required to report accidents. This exemption in California is regarded by many as the maximum exception that should be allowed.

Reports of only six of the most clearly defined and most easily recognizable of occupational diseases are as yet required, except in Maryland. But here also the tendency is toward greater inclusiveness. This is shown in the 1912 Maryland law, which requires physicians to report all occupational diseases, and also in the request made by the New York Department of Labor that all such diseases be reported.

2. *Failure to include all accidents.*—Over half the states requiring reports of accidents do not include all accidents in the given occupations but only those of a certain degree of seriousness. This degree varies in the different states, from two days' or more loss of time in Ohio to thirty days' loss of time in Illinois. Three states specify one week as the minimum, one state specifies two weeks, and still another fifteen days. This variability destroys the value of the statistics for purposes of comparison. An accident in one state does not mean the same as an accident, in exactly the same occupation and resulting in exactly the same kind of an injury, in another state.

3. *Lack of standard time limit for reports.*—Most of the states fix a time limit within which reports must be made, and prescribe a penalty of fine for failure or neglect to comply with the laws. This period varies, some of the laws requiring immediate and others annual notification. Two states require accident reports "at once", one in twenty-four hours, two within two days, one within three days, one within five days, one within fifteen days, and two within thirty days. Forty-eight hours is regarded by many experts as the period that should be allowed. A standardization of this period would be desirable, since the accuracy with which certain questions can be answered varies with the time elapsed since the accident.

4. *Failure to make reports.*—In the majority of cases of accident reports, the employer or some one under his direction fills out the schedule. If any questions are not satisfactorily answered, either the blank is returned for further information, or an inspector of the labor department is sent to investigate. This method is less expensive than sending a special agent to collect the facts in the first instance. When a penalty has been imposed by statute for failure to fill out and return the schedule, it has resulted in substantial increases in the number of accidents reported. Nevertheless, it is well known that many are not reported even in those occupations where the law requires reports, not to mention those occupations, more or less dangerous, reports of accidents in which are not required. In Wisconsin it was made the duty of physicians to report accidents, but the annual report for 1909-10 doubted the completeness of the results. The fact was cited that, during the year, at least fifty fatal accidents were noted in a Milwaukee paper which were not reported by physicians. But there will be far less difficulty in securing complete accident returns in the states which have put compensation schemes into operation. This information should be collected uniformly and made available for statistical purposes.

Reports of occupational diseases are made by physicians. The laws have not yet been in operation long enough to tell how complete are the statistics obtained.

5. *Confusion as to the department which receives the reports.*—Besides the difficulties which arise from negligence or unwillingness to report injuries, there is more or less confusion among the states as to what department or bureau receives the reports. In some states accidents in mines are reported to a separate bureau of mines, accidents in factories to the department of factory inspection, and accidents on railroads to the railroad or public service commission. In some of these states the departments of labor attempt to combine all the data in their annual reports. Sometimes the law requires duplicate reports to be sent to the special bureau and to the labor department.

The accident reporting law in Illinois originally required that all employers report accidents causing death or thirty day's loss of time, to the bureau of labor. A later act, in 1910, required reports to be made to the chief factory inspector, from all employers under

his jurisdiction, covering accidents which caused fifteen days' loss of time. This later act repealed, in fact, the part of the general act relating to factories. The chief factory inspector turned over his data to the bureau of labor for tabulation and report. But this left statistics of part of the non-fatal accidents in Illinois to be collected on a basis of thirty days' loss of time and reported to the bureau of labor, and part to be collected on a basis of fifteen days' loss of time and reported to the chief factory inspector. The result of this irregularity showed at once in the apparent increase of accidents for the first year following the new method of reporting. The law further required reports of accidents in mines to be made to the mine inspector, as well as to the labor department. A discrepancy occurred in the figures of the two departments.⁷

The New York Commission on Employers' Liability⁸ declared that it was impossible to state accurately the number of accidents reported in New York in 1910, because each of the three offices receiving reports—the labor department, the public service commission of the first district, and that of the second district,—had a different system of compiling statistics.

The New Jersey Bureau of Labor Statistics, which does such excellent work in publishing wage data, reports confusion in the records of accidents in that state. The bureau has collected reports of accidents from newspaper accounts and has published these results as part of its annual report. It declares this to be the only available source of information. Yet the factory laws require all factory owners, including owners of bakeries, to report serious accidents to the factory inspection department. In 1911 the legislature further required all employers to report accidents to the commission on employers' liability. This latter act was modified in 1912 so as to require employers to notify the commissioner of labor of all accidents resulting in two weeks' loss of work.

Enough has been said on this point to indicate the desirability of having one state bureau a clearing house and place of record for all data on industrial accidents and occupational diseases. This conclusion does not deny that the work of mine and factory inspection should be delegated to bureaus of experts.

⁷ *Fourth Annual Report of Illinois Bureau of Labor Statistics*, pp. 7-8.

⁸ *Second Report of the New York Commission on Employers' Liability*, p. 2.

INADEQUACY OF SCHEDULES IN USE

The following tabulation of nineteen states⁹ shows how many ask each specified question in their schedules of inquiry in regard to accidents. These facts have been ascertained, for the most part, by direct correspondence, and from examination of the blanks used and of the annual reports of the various state bureaus. The questions are usually classified under information about the employer, the injured, the cause, responsibility, time, conditions, nature and extent of the injury; but, in the present arrangement, the questions are stated in order of importance, as judged from the number of state schedules containing them.

<i>Questions asked</i>	<i>Number of states</i>
(1) Name of the injured person.....	19
(2) Date—month and day	18
(3) Age of the injured	17
(4) Occupation of the injured	17
(5) What caused the accident?.....	17
(6) Exact nature of the accident.....	17
(7) Name and address of the employer.....	16
(8) Sex of the injured.....	16
(9) Address of the injured.....	14
(10) Name of the machine or part causing accident.....	14
(11) Location of plant of employer.....	13
(12) Nature of the business or industry.....	13
(13) Hour of day at which accident occurred.....	13
(14) Conjugal condition of the injured.....	12
(15) Probable period of disability.....	10
(16) How did the accident occur?.....	9
(17) Dependents of the injured.....	9
(18) Nationality of the injured.....	8
(19) Wages of the injured.....	8
(20) How long had the injured been in the occupation?.....	7
(21) Was the thing causing accident guarded;—if not, why not?.....	7
(22) How long had the injured person been at work with or at the thing causing accident?	6
(23) <i>Responsibility</i> : (a) Fault of employer, agent, or machinery admitted; (b) wilful misconduct of employee injured; (c) contributory negligence of the injured	6
(24) Has injured resumed work;—if so, on what date?.....	6

⁹ Connecticut, Iowa, Illinois, Kansas, Massachusetts, Maine, Michigan, Minnesota, Missouri, Nebraska, New Jersey, New York, Ohio, Oklahoma, Oregon, Pennsylvania, Washington, Wisconsin, and West Virginia. Most of these facts were gathered about a year ago.

(25) Negligence of fellow servant.....	5
(26) Hours at work on day of accident.....	5
(27) Was accident fatal, serious, severe, or slight?.....	5
(28) Describe guard or safety device.....	4
(29) Suggestions to prevent similar accidents.....	4
(30) Day of week of accident.....	4
(31) Attending physicians—names and addresses.....	4
(32) Did the accident cause permanent total disability?	4
(33) Did the accident cause permanent partial disability?	4
(34) Did the accident cause temporary disability?	4
(35) Loss of time in working days.....	4
(36) Did the injured person understand English?.....	3
(37) How long was the injured in the establishment?.....	3
(38) Have you taken precaution against the repetition of the accident?	3
(39) Where was the injured person sent?.....	3
(40) Name and address of manager in charge.....	2
(41) Was the injured aware of danger;—what instructions were given?	2
(42) Did the injured make proper use of safety devices?.....	2
(43) Time of piece worker.....	2
(44) Was the injury due to natural hazards of industry?.....	2
(45) Names and addresses of witnesses of accident.....	2
(46) Loss in wages.....	2
(47) Number of employees.....	1
(48) In what language was the injured person instructed?.....	1
(49) Physical defects of eye or ear.....	1
(50) Was the injured person insured?.....	1
(51) Personal habits of the injured.....	1
(52) In whose control was the machine or part causing injury at the time of accident?	1
(53) Has any accident occurred under similar circumstances, at same place, or with same apparatus?.....	1
(54) Was safety device removed; if so, by whom?.....	1
(55) Condition of lighting	1
(56) Crowding of workers on floor space.....	1
(57) Classification of injury:—(1) Internal; (2) loss of hands, feet, eyes, limbs; (3) sprains, dislocations, fractures, broken bones; (4) lacerations, bruises, cuts, burns.....	1
(58) Medical and surgical attention since accident.....	1

This analysis reveals a great variety of questions asked by the various states in many combinations. It shows too little agreement on the essentials. In order to agree on the essentials in such an inquiry there must be discussion and an understanding of the problems in the solution of which statistical data may be useful.

FACTS NEEDED IN INDUSTRIAL ACCIDENT REPORTS

1. *Influence of long hours and fatigue.*—Miss Goldmark, in her recent publication on *Fatigue and Efficiency*, has described, with great wealth of concrete illustration, the nature and results of fatigue in modern industry. It would seem that fatigue is one of the important causes of accidents,¹⁰ and it certainly predisposes the worker to some diseases.

Careful record of certain kinds of information should throw light on this important problem. Exact knowledge is needed as to the nature of the business, whether seasonal or not, whether piece or time work, the hours of work, and the speed of operation; as to the age, sex, and experience of the worker; and as to the hour of the day, the day of the week, and the number of hours worked on the day of the accident. Only one-third of the states seek information as to the experience of the worker and none of them have attempted to record information as to the speed of operation at various periods of the day or year. Yet, if we would draw accurate conclusions as to the effect of fatigue, we need exact information on the other possible hypotheses to account for accidents. A monthly record of the number employed by each employer, classified by sex and age, and whether at day or night work, should be required by the state bureau in charge of labor statistics. This would make possible the calculation of accident rates at day and at night work, as well as at various seasons of the year, and would throw light on the effect of rush seasons and temporary labor upon the frequency of accidents. At present, even if the records show more accidents at certain seasons, it is not significant. It is exceedingly important to know whether the accident occurred at day work or night work, during a period of normal work or of overtime work.

The *Report of the New York Employers' Liability Commission* declares¹¹ that it was the common opinion of witnesses, although they had no figures to prove it, that excessive hours increase the number of accidents in continuous industries like paper and pulp, and steel, where a two-shift system prevails. We know something about long hours of labor in the steel industry¹² but the state of

¹⁰ "The Relation of Fatigue to Industrial Accidents," *American Journal of Sociology*, January, 1912.

¹¹ *Second Report of the New York Commission on Employers' Liability*, p. 22.

¹² Reports of the United States Bureau of Labor on *The Strike at Bethle-*

Pennsylvania does not keep any careful record of accidents in her great steel business. It is, therefore, impossible to correlate accidents with long hours of work in Pennsylvania. It is left for special inquiries, such as the "Pittsburgh Survey", to attack this problem. Usually in our state reports, when the working day is discussed, the average length is given. But, if we would throw light on the relation of long hours to accidents, we need more exact information as to the percentage of employees who work a given number of hours per day. It has been shown that accidents have occurred on railroads because too long service, without rest or sleep, has been required of employees. Legislation has been the result in many states.

For extensive published data on the hours when accidents occur, we must turn to foreign sources, but several of our states are now publishing these facts and more than a dozen are gathering the data on their schedules of inquiry. In the volume of the report of the United States Commissioner of Labor on the condition of woman and child wage-earners which is devoted to the metal trades,¹³ there is a tabulation of about 15,000 accidents, by hour of occurrence. Four sets of figures are used, collected by different agencies, in different parts of the United States, at different times, and covering different industries, each agency working independently. The results show a striking similarity and, in at least two particulars, a suggestive and rather unexpected distribution. They show (1) that the hourly proportion of accidents does not increase to the last hour of work, as the influence of fatigue might lead one to expect, but is highest about the middle of the working period; and (2) that the proportion of accidents is usually greater for the morning than for the afternoon. The German published tabulations¹⁴ as to the hour of occurrence, as well as the most recent statistics in Minnesota and Wisconsin¹⁵ agree essentially with the above statements.

From these facts it is apparent that the explanation of accidents

hem Steel Works, 1910, and on Conditions of Employment in the Iron and Steel Industry in the United States, 1912.

¹³ *Report on Condition of Woman and Child Wage-Earners*, United States Bureau of Labor, Vol. XI:96.

¹⁴ *Bulletin of the (U.S.) Bureau of Labor*, No. 92, pp. 29 et seq. Table 6.

¹⁵ *Twelfth Biennial Report of the Minnesota Bureau of Labor, 1909-10*, p. 137; *Report of the Bureau of Labor Statistics of Wisconsin, 1909-10*, p. 78.

is not a simple task—that fatigue may be a very important cause, but that other factors are also of great importance and demand analysis. It would seem, since more accidents occur, according to all the tabulations, at a considerable time before the noon hour and the closing hour than during the last working hours of the morning and afternoon, that not only long hours of work but also speed must be considered in the explanation. We know very little about the speed of operation, either at different seasons in specific trades, or at various hours of the day.

Such information, to be most useful, must be tabulated by industries and occupations. The various state bureaus should, then, collect and publish the facts according to a uniform scheme in order that we may be able to compare the situation in trades which cover more than one state and to combine and compare the figures obtained in different states. We are not seeking the causes of accidents or the facts about them as an ultimate end, but as a basis for preventive measures. If our accident data were collected on a uniform plan in all states, it would enable us to determine the effect of the various means of prevention adopted by different states. It is the function of statistical data, not only to point the way to a program of action, but also to measure the effects of that program when put into execution. At present, because of the varying schemes of collection and publication of accident data, we cannot compare, for the data collected in two different states do not mean the same thing.

2. *Experience of the injured.*—Another hypothesis to be tested by the facts is that, since a certain time is needed to familiarize the worker with the details and to secure for him the needed practice and correlation of movements, until this period has passed he is more liable to accident. Data on this problem should include a statement as to how many days the injured person has been engaged at the machine or operation by which he was injured, how long in the particular establishment, and how long in the particular occupation. Only one-third of our states inquire as to the time at work in the occupation and with the specific machine or thing causing the accident. Only three states inquire how long the injured had been employed in the establishment. Such information as has been tabulated from foreign and American sources¹⁶ tends to show not only

¹⁶ *Bulletin of the (U.S.) Bureau of Labor*, No. 92:47-48; *Report on Con-*

that more accidents, at least in some occupations, happen to the less experienced, but also that the injuries during these first days are more serious. Such information should be classified by trades in order to show differences in the various occupations.

Furthermore, the whole question of the worker's negligence as a cause of accidents is illuminated by such data. There is some evidence to show that at the very time when the worker is giving the closest attention, because of his lack of experience, the number of injuries is greatest. The safety of the worker often depends upon a great deal of automatic action in coordinating with exact precision two different movements. This is especially true where high speed is required by the employer. The safety device may sometimes interfere with speed and endanger the worker's ability to hold his job. But he is called careless when he throws it aside. It may be the worker's fault, or it may be the employer's responsibility. The real attitude of the injured toward the safety device is a matter of great importance if preventive measures are to be made effective.

3. *Mechanical cause and nature of the injury.*—From the point of view of the prevention of injuries, it is very important to know the mechanical cause and the nature of the injury. At present the one who fills out the report states the facts in his own way with very little guidance from the schedule itself. It is left to the person who tabulates the results to classify them as best he can and to publish or keep them on record. There is, therefore, great variety in the classifications and tabulations found in state reports.

The pressing need is for more uniform and better understood classification of the kinds of injury and the mechanical causes of injury for each industry, not only in order that facts collected in one state may be comparable with those collected in another state, but in order that data for successive years in the same state may be comparable. A classification of the causes of death has been worked out, according to which all deaths, from whatever community reported, are grouped. In the same way there ought to be a standard classification according to which the employer or the physician could describe accidents. A specific accident would then mean the same from whatever shop or community it was reported. These classes of injuries and mechanical causes should be based

dition of Woman and Child Wage-Earners in the United States, Vol. XI:90; Twelfth Biennial Report, Minnesota Bureau of Labor, p. 136.

upon past experience in recording accidents, and always with a view to the practical purposes to be served by the results.¹⁷

From the point of view of the enforcement of existing laws for the safety and health of employees, exact information is desired about the particular shop or process; from the point of view of the enactment of new laws, the important information should relate to certain especially dangerous occupations or processes, concerning which the state may elaborate more specific safety provisions; and from the point of view of compensation or insurance policies for the benefit of the nation's working force, the data from the various states should be comparable, since the large industries of the present day are not bounded by any single state.

4. *Nature and duration of the disability.*—In order to understand the nature and extent of the burden, both individual and social, imposed by accidents, accurate information is necessary as to whether the injury resulted in temporary or permanent, partial or total disability, as to the loss of time and wages, and as to the dependents of the injured. Thus only may we hope to measure the influence of accidents upon the standard of life, which is the significant purpose of our investigations.

In order to apply the principles of insurance in meeting this burden, whether the plan be devised by the state, by the employer, or by insurance corporations, exact information is needed for all the workers suffering accidents in a given trade. As long as there exists so little complete and accurate statistical data upon the nature, the number, and the consequences of industrial accidents, the cost of insurance or compensation schemes will remain a matter of conjecture. For no large industries, except interstate railroads and coal mining, have the facts been collected and published by central authorities, irrespective of state lines.¹⁸ Yet most of the large industries of the country are carried on in more than one

¹⁷ The classification opposite p. 2 of the *Second Report of the New York Liability Commission* illustrates the meaning of such a proposed grouping. Some one may say that this is more a matter for the official who tabulates the accident data than for the person who reports them; but if the person who filled out the schedule knew exactly the scheme of classification into which his description of any accident must fit, it would promote a careful and exact statement of the essentials.

¹⁸ The Interstate Commerce Commission publishes reports of railroad accidents, and the U. S. Bureau of Mines collects statistics of accidents in coal mines.

state. If these states require reports of accidents at all, there is no uniformity in the data reported, the results are not comparable, and the burden of injuries in any specific industry as a whole remains unknown.

An examination of some of the better state reports—for example, those of New York, Wisconsin, and Minnesota—shows further that there is no uniform definition of terms explaining the nature and duration of disability from accident, or the effect upon earning power. Neither is there a uniform method of presenting results so as to render them comparable. The need is for a more definite meaning of terms in the schedule of inquiry, for a clearer understanding of the purposes of tabulation, and for a uniform method of presentation in the reports.

FACTS NEEDED IN OCCUPATIONAL DISEASE REPORTS

Unlike accidents, most occupational diseases do not have a definite, easily identified point of origin. The first fact to be ascertained is, therefore, the occupational origin of the particular disease. That this is of vital importance has been shown by the many instances in which a physician has failed properly to diagnose a case because of lack of knowledge of his patient's occupation. The report, then, must contain a careful statement of the patient's occupation and the industry in which it is pursued; and the physician who makes the report must weigh carefully the causative influence of occupation as compared with other possible causes. As in the case of accident reports, moreover, and for the same reasons, it is necessary to have uniformity between states on all important points, especially on questions of nomenclature.

THE NEED OF A STANDARD SCHEDULE

The preceding discussion suggests the desirability of having the records of industrial accidents and occupational diseases made out on forms drawn up with as much uniformity as the nature of the occupation will permit, and tabulated from year to year according to a general scheme. If such reports were rendered under a federal law, this would be an easy matter. But under our system at present the enactment and administration of practically all reporting laws are in the hands of the states. In some states the pressure for such information is stronger than in others, because public sentiment has

been aroused, because accidents are more frequent, or because the social costs of the neglect of human life and health are more apparent. Such states have been working for years upon the problem of securing more accurate information upon the basis of which a policy of conservation may be worked out. Other states have felt the need for information only in certain dominant industries, such as mining. Still others have not yet been awakened to the problem. It is no wonder, therefore, that there have been many different kinds of reporting schedules.

Situated as our states are, however, in a larger community where state lines do not mark industrial boundaries, this accident problem is no longer simply local. It is wider than that. The purpose of information is prevention of accidents and diffusion of their burdens through some adequate scheme of insurance. But a preventive or insurance policy enacted into law and enforced in one state may, it is frequently claimed, penalize the employers of that state who must compete with employers in the same business in other less advanced states. Moreover, lowered standards of life and loss of earnings, with consequent ill-health and inefficiency, spread their effects in other communities. The growing army of low-paid, standardless men moves on from place to place, from state to state, to menace the standards of other communities. No community can hope to be safe from the consequences of the waste of human life and health. It is necessary, therefore, sooner or later, for the states to cooperate in the campaign for prevention and insurance. But this cannot be done as long as individual self interest rules in place of the interests of the community.

The position of the American Association for Labor Legislation in this matter of reporting accidents and trade diseases is, therefore, clear. Accurate and complete information for all states which have to deal with the accident problem is desired. It is hoped that this information will lead to a growing uniformity of legislation so far as the varying conditions among the states will permit. A schedule of inquiry has been drawn up with the advice of many of those who administer the present state accident laws. This schedule has already been adopted by Massachusetts, New York and Washington, while other states are considering the matter or have closely approached this form of inquiry. The essentials discussed in the first part of this paper have been embodied in this schedule of inquiry. Other questions may be added in any state, but it has been the opinion of those consulted that at least this minimum of information is

needed to understand industrial accidents and to enable the various states to pass such laws as will place employers in different states on an equality of competition. It will enable the authorities to comprehend the accident problem in an industry which operates in more than one state and to deal with it on similar lines, learning constantly from the experience of sister states as to the effects of a given policy. To-day the states cannot thus profit by experience, because the records of the facts do not have the same meaning in two states.

The adoption of this standard schedule involves certain additional legislation in many states before it can be put into effect. The state bureaus must in numerous cases be given authority to collect facts not at present authorized by law. The legislature must support the state bureau in many cases by putting the essential principles of the standard schedule into the law, and in all cases by putting into the hands of the state official power to gather such facts as he may deem necessary to carry the standard schedule into effect. A standard accident reporting bill has now been drafted for this purpose by the Association for Labor Legislation.

A standard schedule for the reporting of occupational diseases, and a standard bill to authorize its use, are equally needed, and fortunately they have already been adopted in several states. So far as it can be ascertained, we are anxious to know the entire burden of occupational diseases as well as of industrial accidents, classified by industries and causes. Such information will lead the way to wise legislation.

Williams, Hon. John, New York State Commissioner of Labor,
Address at Health Officers' Conference (Utica, N. Y., December 2, 1912).

That modern industrial processes are responsible for various forms of disease has been recognized for many years. The increasing number of persons engaged in identical occupations who were under medical treatment and manifesting the same symptoms, led to inquiry as to the causes, and it was found that such persons had contracted diseases by contact with or absorption of certain poisonous substances used in the processes of manufacture in which they were engaged.

In 1911 the legislature of the State of New York, upon the initiative of the American Association for Labor Legislation, enacted a law requiring every practising physician in the state to report to the commissioner of labor every person upon whom he is called to visit or attend, whom he believes to be suffering from poisoning from lead, phosphorus, arsenic or mercury or their compounds, from anthrax, or from compressed-air illness (commonly called "bends"), contracted as the result of the nature of the patient's employment.

It is unnecessary to point out the reason for such a law. The state at last awoke to a realization of its obligation to its citizens. Men engaged in its industrial establishments were falling victims to insidious attacks, culminating in total physical disability and often in death. So, in order to lay a foundation for such preventive and remedial measures as might prove necessary, it was decided to find out definitely the extent, nature and location of the seat of the trouble. This could be accomplished only by securing exact information from those qualified to furnish it.

This law has been in effect for a little more than a year, and we are beginning to find out what employments are surrounded by dangers that are almost invisible, but none the less terribly real and a menace to the persons engaged in such employments. The information that comes into our possession enables us to call direct attention to conditions in factories which threaten the health of the workers.

Wilbur, Dr. Cressy L., United States Bureau of the Census. *American Labor Legislation Review*, Vol. II, No. 2, June, 1912, p. 339.

The notification of all cases of occupational or industrial diseases ought to be a most valuable aid for the complete and satisfactory registration of all deaths from such diseases; and likewise the registration of deaths should be a most important check on the completeness and promptness of the notification.

Thompson, Dr. W. Gilman, Cornell University Medical College. *American Labor Legislation Review*, Vol. II, No. 2, June, 1912, p. 189.

It is clearly undesirable that hasty or unfair legislation, based on insufficient data, should be enacted, and it is therefore of the greatest importance that physicians everywhere enter into hearty cooperation with the state authorities in the collection of accurate statistics which shall be of true scientific value.

References: Among the most important articles on the subject of the reporting of industrial accidents and occupational diseases are: *American Labor Legislation Review*, Vol. I, No. 2, June, 1911, "Comparative Analysis of Existing Laws: Accidents to be Reported"; Vol. II, No. 1, February, 1912, "Uniform Reporting of Industrial Injuries" by Leonard W. Hatch; Vol. I, No. 4, November, 1911, "The Beginning of Occupational Disease Reports", by John B. Andrews; Vol. II, No. 2, June, 1912, "Compulsory Reporting by Physicians", by Leonard W. Hatch; and *Quarterly Publications of the American Statistical Association*, New Series, No. 98, June, 1912, "Reporting of Industrial Accidents", by Robert E. Chaddock. The laws of this country requiring these reports will be found summarized in the annual *Reviews of Labor Legislation* of the American Association for Labor Legislation, and are printed in full in the *Twenty-second Annual Report of the United States Commissioner of Labor* and in the *Bulletins of the (U. S.) Bureau of Labor*, Nos. 85, 91, 95 and 97. The New York State Department of Labor has published a pamphlet for physicians on *Reporting of Occupational Diseases*, which contains the law, a statement of its purpose, and information in regard to the diseases to be reported and their symptoms.

COMPENSATION OF FEDERAL EMPLOYEES FOR ACCIDENTS AND DISEASES

Immediate Legislative Program: Secure a revision of the federal employees' compensation act, including extension of the compensation principle to embrace occupational diseases as well as industrial accidents.

The federal "act granting to certain employees of the United States the right to compensation for injuries received in the course of their employment",¹ approved May 30, 1908, went into effect on August 1 of the same year. The "certain employees" covered are artisans and laborers employed in the manufacturing establishments, arsenals, or navy yards of the United States, or in the construction of river and harbor or fortification work, or in hazardous employment in reclamation work or under the Isthmian Canal Commission. The compensation allowed is regular wages until able to resume work, but in no case extending over one year. Should death ensue within the year, the remainder of the compensation is payable to the widow, to children under sixteen, or to the dependent parents.

With the terms of the act as so adopted there was almost immediate dissatisfaction. The first change to be made was in relation to the limitation of compensation to injuries received in "hazardous employment" in the Canal Zone. In 1909 it was explicitly provided² that nothing in the compensation act was to prevent the Canal Commission from extending leave of absence with pay up to thirty days to injured employees, "whether engaged in a hazardous employment or otherwise". This broadening of the act was carried still further in 1911³ when "all employees" in the Canal Zone were allowed one full year's pay as compensation. The amendment of 1911 took another very important step toward liberalizing the provisions of the law. Previously a workman could

¹ 25 Stat., 556.

² Acts 1908-9, C. 179. Approved February 24, 1909.

³ Acts 1910-11, C. 285, sec. 5. Approved March 4, 1911.

Compensation Provided for Injured Em

Workmen's Compensation Systems of

Compared

	U. S. ACT PROVIDING COMPENSATION FOR INJURED GOVERNMENT EMPLOYEES, MAY 30, 1908; IN EFFECT, AUG. 1, 1908. AMENDED BY ACTS 1911, C. 285; ACTS 1912, C. 57, 255.	SWISS FEDERAL LAW, JUNE 13, 1911; ADOPTED BY NATIONAL REFERENDUM, FEB. 4, 1912.
1	<p>Injuries covered. Accidents.</p> <p>Diseases.</p>	<p>Injuries by accident in course of employment, resulting in death or disability for more than three days, unless caused intentionally; if caused by serious fault benefits are reduced.</p> <p>All diseases due to list of substances to be prepared by the Federal Council.</p>
2	<p>Industries covered.</p> <p>U. S. manufacturing establishments, arsenals, navy yards, construction of harbor or fortification work; hazardous employment in reclamation work, U. S. Bureau of Mines, Lighthouse and Forestry Service; and all employments under the Isthmian Canal Commission.</p>	<p>Railways, steam vessels, postal service; factories; building trades, transportation, telephone and telegraph lines, installing and removing machines, railroad building, tunneling, bridging, road making, waterworks, mines, quarries, production or use of explosives, etc.</p>
3	<p>Employees covered.</p> <p>Artisans and laborers.</p>	<p>All employees and laborers.</p>
4a	<p>DEATH. Amount of Compensation.</p> <p>One year's wages minus amount paid up to time of death; in portions as Sec. of Commerce and Labor or Canal Commission may direct.</p>	<p>Annuity of not to exceed 60 per cent of annual wages; payments monthly; shared in by widow till death or remarriage, by children till 17th year; certain lump-sum provisions. Annual wages not reckoned to exceed 4,000 francs (\$772).</p>
4b	<p>Burial expenses.</p> <p>None.</p>	<p>40 francs (\$7.72).</p>
5a	<p>PERMANENT (TOTAL) DISABILITY. Amount of compensation.</p> <p>Regular wages.</p>	<p>Annuity, 70 per cent of annual earnings computed as above; may be increased up to 100 per cent in case of need of nurse or special care; payments monthly.</p>
5b	<p>Length of compensation.</p> <p>One year.</p>	<p>Life.</p>
6a	<p>PERMANENT PARTIAL DISABILITY. Amount of compensation.</p> <p>Regular Wages.</p>	<p>Annuity, proportional reduction from 70 per cent for total disability; payments monthly; lump-sum payment in certain cases.</p>
6b	<p>Length of compensation.</p> <p>One year.</p>	<p>Life.</p>
7a	<p>TEMPORARY DISABILITY. Amount of compensation.</p> <p>Regular wages.</p>	<p>Indemnity for unemployment, 80 per cent of daily earnings; lump-sum payment in certain cases. Daily earnings not computed to exceed 14 francs (\$2.70).</p>
7b	<p>Length of compensation.</p> <p>During continuance of disability, up to one year.</p>	<p>Until no reason to expect distinct improvement from further medical treatment.</p>
8	<p>Medical treatment.</p> <p>None.</p>	<p>Free medical attendance, drugs, surgical apparatus; if necessary, traveling expenses and nurse.</p>
9	<p>Time loss before compensation begins.</p> <p>15 days.</p>	<p>3 days.</p>
10	<p>Notification limit.</p> <p>90 days; in Canal Zone, 1 year.</p>	<p>National Fund may refuse to pay if not notified within 3 months through inexcusable delay.</p>
11	<p>Prevention of accidents.</p> <p>None specified in act.</p>	<p>Employers required to take all necessary measures which can be applied. Maximum penalty 500 francs (\$96.50), or imprisonment for 3 months, or both.</p>
12	<p>Source of payments.</p> <p>Paid by department in which accident occurs, from same appropriation as that set for its work.</p>	<p>Premiums for occupational accidents and diseases paid entirely by the employer; national subsidies and initial grant of 10,000,000 francs (\$1,930,000) to the National Accident Insurance Fund.</p>
13	<p>Disputes.</p> <p>No appeal.</p>	<p>Settled by cantonal court; appeals to federal insurance court.</p>

* These three European countries are the leading ones which compensate for industrial diseases (the compensation act of 1900, the effect of which is to establish compensation for the six industrial employees only) and in Spain, the law may be interpreted to cover industrial diseases.

ployees of the United States Government with Switzerland, Germany and Great Britain*

GERMAN WORKMEN'S INSURANCE CODE, JULY 19, 1911.	GREAT BRITAIN, WORKMEN'S COMPENSATION ACT, DEC. 21, 1906; IN EFFECT JULY 1, 1907.	
Injuries by accident in course of employment, resulting in death or disability for more than three days, unless caused intentionally.	Injuries by accident arising out of and in course of employment which cause death or prevent a workman for one week from earning full wages. No compensation in case of willful misconduct, unless result is death or permanent, serious disablement.	1
Federal Council may extend accident compensation to specified occupational diseases.	24 diseases now compensated as accidents; Secretary of State has power to add others to schedule.	
Mines, salt works, quarrying and similar industries, ship yards, factories, smelting works, building trades, chimney sweeping, window cleaning, butchering, transportation and handling, agriculture, forestry, navigation, fisheries, breweries, pharmacies, tanneries, ice cutting, livery establishments, etc.	"Any employment."	2
All workmen; also establishment officials earning less than 5000 marks (\$1,190) per year.	All manual laborers, and any person regularly employed whose earnings are less than £250 (\$1,216.63) per annum.	3
Pension of not more than 60 per cent of annual earnings; payments monthly; shared in by widow till death or remarriage, by children till 16th year; certain lump-sum provisions. In so far as annual earnings exceed 1800 marks (\$428.40) excess is reckoned at only 1/3.	Sum equal to three years' earnings, but between £150 and £300 (\$729.98 and \$1,459.95) to persons wholly dependent; less, to be settled by arbitration, to those partially dependent; invested or applied by order of county court.	4a
1/15 annual earnings, but not less than 50 marks (\$11.90).	If deceased leaves no dependents; not to exceed £10 (\$48.70), including medical care.	4b
Pension, 66 2/3 per cent of annual earnings, computed as above; may be increased up to 100 per cent in case of necessity of services and care of others; payments monthly.	Weekly payment not more than 50 per cent average weekly earnings, but not over £1 (\$4.87); lump-sum payment in certain cases, invested or applied by order of arbitrator or county court.	5a
Life.	Life.	5b
Pension, proportional reduction from 66 2/3 per cent for total disability, according to loss of earning power; if unemployed full pension may be paid for a time; payments monthly; lump-sum in certain cases.	Weekly payment not exceeding loss in earning power; lump-sum payment in certain cases as under permanent disability.	6a
Life.	Life.	6b
Sickness benefit 50 per cent of average daily wage of craft from 1st to 5th week; 66 2/3 per cent from 5th to 13th week; thereafter accident pension as in case of permanent disability. Daily wage not computed to exceed 6 marks (\$1.43).	Same as permanent total disability; if incapacity lasts less than two weeks no compensation for first week.	7a
During continuance of disability.	During continuance of disability.	7b
Free medical attendance, drugs, eyeglasses, surgical apparatus.	In case of death only; see burial expenses.	8
3 days.	One week.	9
Two years; longer under certain conditions.	Six months; longer under certain conditions.	10
Employers' compulsory accident associations required to issue regulations; maximum penalty for members 1000 marks (\$238), for insured persons 6 marks (\$1.43).	None specified in act.	11
First 4 weeks, sick funds to which insured persons contribute 2/3, employers 1/3; 5th to 13th week same, and 16 2/3 per cent of earnings added by employers or accident associations direct; 13th week on, accident associations contributions to which are paid entirely by employers.	Entire cost rests on employer, who may transfer liability to certified insurance scheme; special provisions for bankruptcy.	12
Settled by insurance arbitration courts.	Settled by arbitration committee, by judge of county court, etc.	13

as well as accidents. Besides these, South Australia, on Dec. 14, 1911, adopted an amendment to diseases originally listed under the British act, and upon almost the same terms. In Bulgaria (state

collect compensation only if he filed his claim within ninety days. The amendment extended this time, for canal employees, to one year.

But the number of employees benefited by the act was still felt to be too small. Two more amendments, both looking to the correction of this fault, were adopted in 1912. One extended the compensation to artisans, laborers and other employees engaged in hazardous work under the Bureau of Mines or the Forestry Service;⁴ and the second granted the same indemnity to persons employed by the United States in any hazardous employment in the Lighthouse Service.⁵ A subsequent act authorized the President to provide by executive order a new method for the determination and adjustment of personal injury claims made by employees of the Panama Canal or of the Panama Railroad, and to prescribe a schedule of compensation for injuries to such employees.⁶

No figures are yet available for the operations of the act under these last two amendments; but in the three years and four months from the time the original act went into effect to December 1, 1911, compensation was paid in 5,564 cases of injury, of which one hundred and sixty-five were fatal. The compensation paid amounted to \$817,693.62, exclusive of claims paid direct by the Canal Commission after March 4, 1911. During the first two years 11,846 accidents were reported, but only 4,429 claims were filed; of these only 4,188 were allowed. The great disproportion between the number of accidents and the number of claims, and to a lesser degree that between the number of claims filed and those allowed, point decisively to the need of still further enlarging the scope of the act.

A comparison of what the United States does for its injured workmen with what the most liberal foreign countries are not only doing for their own employees, but are requiring private employers also to do, shows the most glaring contrasts—none of them, unfortunately, to the advantage of the United States. For instance:—

In the United States the heirs of a workman who is killed receive at most a sum equal to his wages for one year. In Italy the sum received is equal to five years' earnings, within certain limits, and

⁴ Acts 1912, C. 57. Approved March 11, 1912.

⁵ Acts 1912, C. 255. Approved July 27, 1912.

⁶ Acts 1912, C. 390. Approved August 24, 1912.

in Germany all the heirs combined receive a pension of not over 60 per cent of his pay, in which the widow shares until death or remarriage, and minor dependents share until their sixteenth year.

In the United States a workman completely and permanently incapacitated receives only one year's pay. In England he is granted for life an annuity of 50 per cent of his regular earnings, in Germany of $66\frac{2}{3}$ per cent, and in Switzerland of 70 per cent.

In the United States a workman must be so severely injured as to be incapacitated for at least fifteen days in order to be entitled to any compensation whatever. In Austria, Cape of Good Hope, Germany, Hungary, Luxemburg, Russia, and Switzerland he is entitled to indemnity after three days, in the Netherlands after two days, and in Italy and Spain the payment begins on the day of the accident.

In the United States a workman who contracts lead poisoning as a result of his employment is not granted any compensation whatever; the law applies only to injuries or (by interpretation) diseases, received "by accident". In England sufferers from a list of twenty-four industrial diseases are compensated in the same amounts as if incapacitated through injury by accident; in South Australia six trade diseases are so treated; in Switzerland, by the sickness and accident insurance law of 1912, the Federal Council is instructed to draw up a list of dangerous substances causing industrial diseases, and similar authority has been conferred on the Federal Council of Germany,—diseases so caused to be compensated for in the same way as accidents.

Four years' experience under the present law indicates the need, not only of a more liberal system of compensation, but of additional provisions for the prevention of industrial accidents and diseases in government employments. Preventable injuries should no longer be regarded as "the natural and inevitable results of employment."

Obviously, the United States law, as it stands, is out of harmony with modern conceptions and possibilities of justice. The question is one which is now prominently before the country. A bill embodying the most important immediate changes to be incorporated in our federal employees' compensation act has been drafted by the American Association for Labor Legislation for introduction at the present session of Congress.

References: For a brief, popular presentation of the subject of disease and accident compensation for federal employees see the address delivered by Dr. I. M. Rubinow, at the fifth annual meeting of the American Association for Labor Legislation, 1911, published in the *American Labor Legislation Review*, Vol. II, No. 1. Important documentary material bearing on the subject can be found in the following publications: *Bulletin of the International Labor Office* (International Association for Labor Legislation), Vol. I, Nos. 1, 2, 3; *Twenty-fourth Annual Report of the (U.S.) Commissioner of Labor* (Washington, 1909); *Bulletins of the (U.S.) Bureau of Labor*, Nos. 90, 96, and 103 (Washington, September, 1910; September, 1911; and August, 1912); *Federal Employees' Compensation, Hearings before the (House) Committee on the Judiciary* (Washington, 1912); and *Workmen's Compensation under Act of May 30, 1908, Opinions of Solicitor for (U.S.) Department of Labor* (Washington, 1912).

STATE WORKMEN'S COMPENSATION LEGISLATION

Immediate Legislative Program: Aid in the enactment of additional state laws providing just systems of compensation or insurance against industrial injuries.

The history of workmen's compensation legislation in the United States has been short and uneven, but with a decided trend toward stability. Only ten years ago, in 1902, Maryland enacted the first compensation law in the country, a law relating only to accidents in coal mines. It was promptly declared unconstitutional.

Nothing more was done for seven years. Then in 1909 Montana enacted another coal mine act. This survived for two years, and in November, 1911, went the way of its Maryland predecessor. But in 1909, commissions on workmen's compensation had been appointed in Minnesota, New York, and Wisconsin. In the two last named states the investigations bore fruit in compensation laws. In New York the compulsory act of 1910 was declared unconstitutional on the first case tried under it, in March, 1911. An elective compensation law, passed in New York in 1910, is still on the books, but is a dead letter, only one employer having elected to come under it. In Wisconsin an elective law was enacted in 1911.

Despite the rather unsatisfactory outlook at the beginning of 1910, the compensation idea had so far grown in favor that the year saw no fewer than eight more state commissions studying the problem. In Maryland a second coal mine act was passed. As a result of studies by the commissions, bills were introduced in all eight states, as well as in four where there were no commissions. The results were gratifying. Elective state insurance laws were enacted in 1911 in Ohio and Massachusetts; a compulsory state insurance law in Washington; elective compensation laws in California, Illinois, Kansas, New Hampshire, and New Jersey; and a compulsory compensation law in Nevada. In Missouri and Montana the commissions' bills were not enacted into law. The year 1911 thus closed with twelve state accident insurance or compensation laws either in force or enacted and about to go into effect.

While the legislatures of 1911 were occupied with this mass of legislation, a new set of state commissions, ten in number, were put to work. The Michigan commission made its report, and the law was enacted in 1912. In the same year a law was secured in Maryland, where the commission measure had previously failed to carry, and Arizona and Rhode Island enacted laws without having had any commission. The 1911 commissions in Iowa and Pennsylvania have published their reports and the texts of proposed laws. In the other seven states having commissions in that year,—namely, Colorado, Connecticut, Delaware, Nebraska, North Dakota, Texas and West Virginia,—no reports have as yet been published.

Of the forty-eight states in the union, fifteen now have compensation acts of one type or another, of which four—those of Ohio, Massachusetts, Washington and Wisconsin—have withstood the attacks of opponents of this legislation and have been declared constitutional. In twenty-one states commissions have already been appointed to study the problem. In six states laws have been secured without preliminary study by commissions. There remain twenty-one states in which no official action, either in the enactment of laws or the appointment of commissions, has yet been taken toward displacing the outgrown and thoroughly discredited system of employers' liability.

The adoption of some uniform compensation measure, and its extension to all states, including those which have so far taken no action, is urgently needed. Upon this matter the committee on compensation for industrial accidents and their prevention, of the American Bar Association, reported to the association's annual meeting in Milwaukee last August as follows:

The consensus of opinion is that uniform laws for compensation for industrial accidents should be enacted by all the states and by the United States within its jurisdiction. Such a law should, in the opinion of your committee, be based on the following principles:

1. It should be compulsory and exclusive of other remedies for injuries sustained in course of industrial employment.
2. It should apply to all industrial operations or at least to all industrial organizations above a certain limit of size.
3. It should apply to all accidents occurring in the course of industrial operations regardless of the fault of anyone, self-inflicted injuries not being counted as accidents.
4. The compensation should be adjudicated by a prompt, simple and inexpensive procedure.
5. The compensation should be paid in regular installments continuing dur-

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ing the disability, or in case of death during dependent period of beneficiaries.

6. The compensation should be properly proportioned to the wages received before injury.

7. The compensation should be paid with as near absolute certainty as possible, in the most convenient manner, and there should be adequate security for deferred payments. . . .

Your committee, however, is of the opinion that a very important branch of the subject referred to is the prevention of industrial accidents and that every effort should be made to procure the adoption of uniform laws for proper safeguarding of industrial employees from accident, and that this element should always be considered in connection with any scheme for industrial accidents.

Signed: CHARLES HENRY BUTLER (Chairman), THOMAS W. SHELTON, ALPHEUS H. SNOW, HUGH V. MERCER, ALBERT RITCHIE, ERNST FREUND.

References: Among the important sources of information on the subject of workmen's compensation that are readily available are: *Accident Prevention and Relief*, the results of an investigation made for the National Association of Manufacturers by Ferdinand C. Schwedtman and James A. Emery (New York, 1911); *Work Accidents and the Law; The Pittsburgh Survey*, by Miss Crystal Eastman (Charities Publication Committee, New York, 1910); *Industrial Insurance in the United States*, by Professor Charles Richmond Henderson (Chicago, 1909); *Risks in Modern Industry, Annals of the American Academy of Political and Social Science*, Vol. 38, No. 1, July, 1911; and *Hearings held before the (U.S.) Employers' Liability and Workmen's Compensation Commission* (Washington, D. C., 1912). There are also articles in the *American Labor Legislation Review*, Vol. I, No. 1; and Vol. II, No. 1. The Library of Congress has printed an exhaustive bibliography on the subject.

INVESTIGATIONS INTO INDUSTRIAL HYGIENE AND SAFETY

Immediate Legislative Program: Encourage the investigation of industrial accidents and occupational diseases by state and national authorities, and urge upon the federal government proper provision for the study and advancement of industrial hygiene and safety.

The first thing needed for the prevention of accidents and occupational diseases is information, not merely statistics, but facts in regard to the causes which bring about and the measures necessary to prevent this unnecessary waste of human life and energy. Only by the publication of facts authoritatively ascertained can a substantial foundation be laid for legal rectification of conditions which we all recognize as a disgrace to civilization. The different states should make thorough investigations of conditions within their own borders, and the scattered federal investigations in the field of industrial hygiene and safety should be correlated and placed under the direction of one national agency, which should be thoroughly equipped, manned, and financed for making comprehensive studies into the conditions of safety and hygiene in American industry.

In Illinois and New York special investigations of occupational diseases have been made by state commissions, and the results have been published.¹ Among the state agencies which are now conducting investigations of this subject are the boards of health of Ohio, Massachusetts, and Michigan, and the Industrial Commission of Wisconsin. The federal Commission on Industrial Relations is authorized to inquire into "the conditions of sanitation and safety . . . and the provisions for protecting the life, limb, and health of the employees". But so many other subjects are assigned to this commission that it is extremely doubtful whether it will be able to cover the subject of industrial accidents and diseases with anything

¹*Report of the (Illinois) Commission on Occupational Diseases, January, 1911; Preliminary Report of the New York Factory Investigating Commission, 1912.*

like the thoroughness that is needed. Moreover, permanent provision for such study is demanded.

Eastman, Crystal. *Work Accidents and the Law: The Pittsburgh Survey* (New York, 1910), pp. 4-5.

A social investigation is justified when there are grounds for belief that wrong exists in certain relations between individuals, a wrong of sufficient importance and extent to warrant concerted interference on the part of the community. When to such a belief is added a general conviction that this wrong results in a great public tax, a drain upon the productive forces of the community, the need for investigation becomes urgent. With regard to the work-accident problem, such a belief and conviction has long existed,—based not only upon newspaper stories, magazine articles, and hearsay, but upon the common knowledge and experience of working people. . . .

If adequate investigation reveals that most work-accidents happen because workmen are fools, then there is no warrant for direct interference by society in the hope of preventing them. If, on the other hand, investigation reveals that a considerable proportion of accidents are due to insufficient concern for the safety of workmen on the part of their employers, then social interference in some form is justified.

American Labor Legislation Review, Vol. I, No. 1, Memorial on Occupational Diseases, prepared by a committee of experts and presented to the President of the United States (Sept. 29, 1910).

It is a generally accepted principle of modern sanitary science that a large amount of sickness in industry or otherwise is preventable, and that the average duration of life can be materially prolonged by deliberate and rational methods of personal, social and industrial hygiene. . . . The probable amount of possible sickness reduction [among about 33,500,000 workers for salaries or wages in the United States] may be conservatively placed at not less than 25 per cent. . . . On the theoretical assumption that of the probable amount of sickness among the workers of the nation, one-fourth at least is due to strictly preventable causes, the number of days of sickness per annum can, by deliberate efforts, be diminished by 71,187,500, and the resulting total economic gain to the nation may be estimated at not less than \$193,223,215 per annum. . . .

Practically all the standard works of reference on occupational diseases are by English or continental authorities. There is no modern treatise on the subject by an American authority on industrial hygiene, and the occasional official investigations which have been made into health conditions of particular trades only emphasize the necessity of a more thorough and strictly *scientific inquiry by national authority*. . . . The real requirements are statistics of morbidity and trustworthy information regarding the actual conditions under which American industries are carried on and the relation of such conditions to the longevity and sickness rates of the employees. . . . Foreign statistical and other data on occupational diseases naturally have their inherent limitations on account of more or less essential differences in industrial pro-

cesses or the conditions and circumstances under which American industries are carried on, and it is, therefore, the conviction of this committee that, for the development of rational principles of governmental or state action in matters of this kind, the whole subject requires to be investigated and reported upon by national authority. . . . A comprehensive national inquiry into the whole subject of occupational diseases is urgently called for.

Signed: HENRY BAIRD FAVILL, FREDERICK L. HOFFMAN,
DAVID L. EDSALL, FREDERICK N. JUDSON,
CHARLES R. HENDERSON.

Warthin, Dr. A. S. "A Preliminary Report on Some Occupational Diseases Occurring in Michigan," *Public Health*, Michigan, January-March, 1912, p. 77.

Much broader laws aimed at the prevention of occupational diseases are greatly needed in this state [Michigan]. For this reason, and because future legislation concerning workmen's compensation and insurance must have such a foundation before intelligent action can be taken, and finally because Michigan presents certain forms of occupational diseases of great scientific interest, the appointment of a commission on the investigation of occupational diseases in Michigan . . . is strongly recommended. Such a commission should collect all data as to the occupational diseases occurring in Michigan, and recommend legislation for their prevention.

American Labor Legislation Review, Vol. II, No. 2, June, 1912, Introduction, p. 181.

The Memorial on Occupational Diseases, prepared by a committee of the first conference [of the American Association for Labor Legislation on that subject], laid the foundation for and strongly urged national investigation of industrial hygiene. One after another eight states have since then passed the Association for Labor Legislation's standard bill requiring physicians to report all cases of certain diseases of occupation. The work of the one state commission, in Illinois, led to the enactment of a special occupational disease law requiring monthly medical examinations of workmen in a few of the most hazardous employments. In April, 1912, the United States Congress agreed, by passing the Association's bill placing a prohibitive tax on poisonous phosphorus matches, to abolish "Phossy Jaw", the occupational disease due to the one industrial poison which had then been thoroughly studied. In the meantime, the List of Industrial Poisons, prepared by the International Association for Labor Legislation and translated by the United States Bureau of Labor, gave definite direction to further investigations. Reports on industrial poisoning from lead and mercury have already been published, and medical inspection of factories has increased in importance.

The Second National Conference on Industrial Diseases, in Atlantic City, June, 1912, was attended by practising physicians, state and federal public health officials, medical inspectors of factories, physiologists, investigators and statisticians, manufacturers, efficiency engineers, insurance experts, labor

leaders, economists, and social workers. Through an industrial hygiene exhibit, the first extensive display of the kind in America, industrial processes dangerous to health and the effects of these peculiar work hazards, including such diseases as "phossy jaw", lead poisoning, arsenic poisoning, compressed-air illness, and numerous occupational eye and skin diseases, were graphically placed before the audience. These photographs, charts and drawings were realistically and effectively supplemented by stereopticon illustrations, made by the new process in color photography. Finally, through the medium of a joint session with the American Medical Association, that organization, for the first time in the sixty-six years of its existence, gave a place to the industrial disease problem on its annual program.

There is now scarcely a public meeting of importance for the discussion of any phase of the labor problem that does not include at least some mention of occupational diseases. Three federal bureaus are now making investigations in their own respective fields, and several state commissions, bureaus of factory inspection, and boards of health are at work upon the problem. The American Association for Labor Legislation has now published no less than forty papers and reports on occupational diseases and industrial hygiene. The publication . . . through the cooperation of the Association for Labor Legislation, the Library of Congress, and the United States Bureau of Labor, of a special Bibliography on Industrial Hygiene, will make further researches less difficult.

Hoffman, Frederick L. "Industrial Diseases in America", *American Labor Legislation Review*, Vol. I, No. 1, January, 1911, p. 40.

The plea is, first for the appointment of a national commission to investigate and report upon the whole subject of industrial diseases; second, for the foundation of a national institute of industrial diseases upon the broadest plane of a liberal philanthropy corresponding to the great foundations of generous-minded givers in other fields; third, for the establishment of a national institute for the improvement of labor conditions, including a thoroughly equipped museum for safety devices. It would perhaps be difficult to comprehend a more ambitious program in a few words, but where the issue at stake is the well-being of the wage-earning masses, who by their toil contribute the sum and substance of our national wealth, the object to be attained is well worth the required effort, and it is to be hoped that through persistent agitation on the part of the American Association for Labor Legislation these hopes and plans will be realized in a not far distant day.

References: For a critical bibliography on the subject of industrial hygiene, prepared by the American Association for Labor Legislation, the United States Bureau of Labor, and the Library of Congress, see the *American Labor Legislation Review*, Vol. II, No. 2.

PROTECTION FOR WORKING WOMEN

Immediate Legislative Program: Cooperate in securing effective legal safeguards for working women.

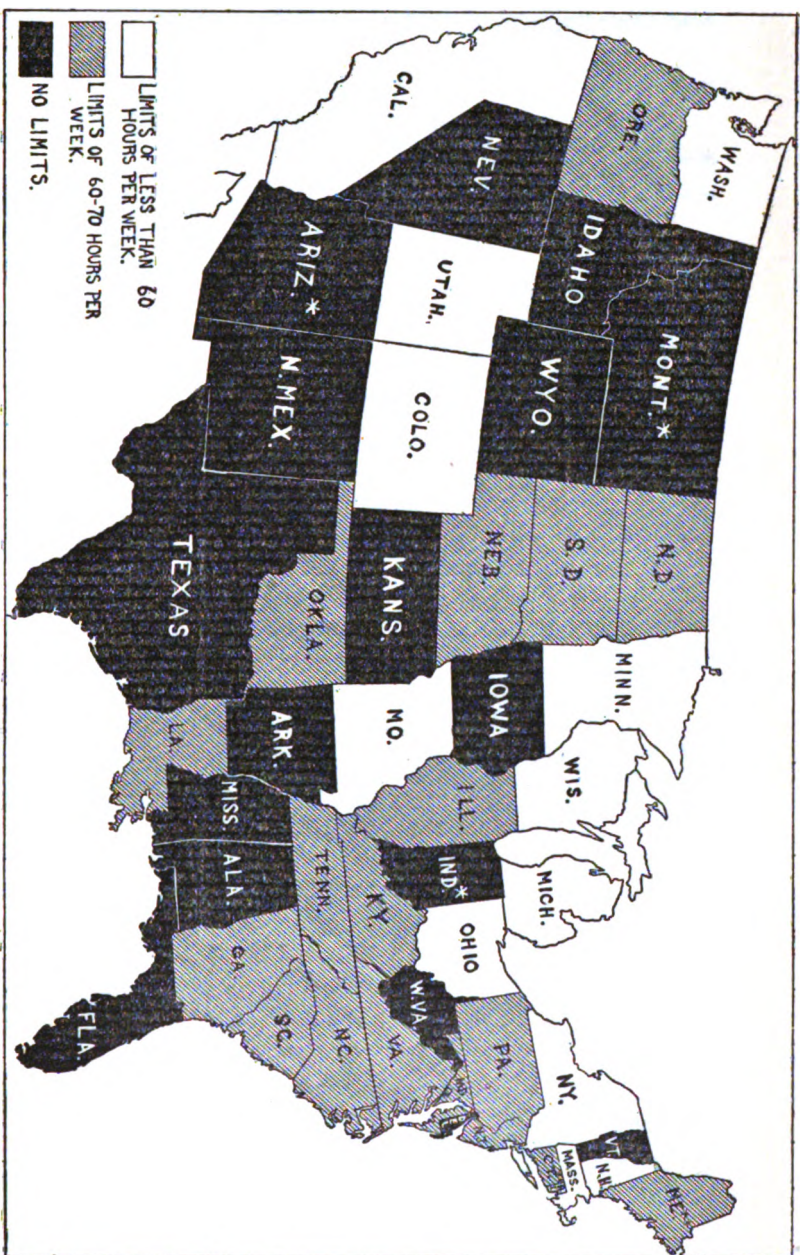
The world-wide recognition of the need of special legal protection for women in industry is shown in the proposals of the International Association for Labor Legislation for international treaties on night-work prohibition and on the ten-hour day. The night-work prohibition has now been adopted by practically all of fourteen countries which signed the convention in 1906; the proposal for a ten-hour day limitation is soon to be laid before the different countries for their ratification.

In America, since the favorable United States Supreme Court decision on the Oregon ten-hour law in 1908, rapid advances have been made in legal limitations upon the hours of work for women. This year the state supreme courts of both Washington and California have upheld eight-hour laws, and Colorado, in November, 1912, by referendum vote, established an eight-hour day for women.

During the last two years in this country pioneer legislation has been enacted by Massachusetts establishing a minimum wage board and by Massachusetts and New York requiring rest periods for working women at the time of childbirth. The idea of prohibiting the employment of women in certain employments in America has scarcely gone beyond the industries of mining and the selling of liquors. Careful investigations of working conditions will undoubtedly result in the extension of this list and will bring out the need of stricter regulations for many of the dangerous and unhealthful trades in which women are now engaged.

In 1909 the Association for Labor Legislation published a tabular summary of state laws which then placed maximum hour limitations upon the labor of women. The demand for that publication (now out of print) and a continual stream of requests for up-to-date information on woman's work, have led to the following revision and enlargement of that material to meet the needs of present members of the Association.

For a standard bill, developed out of the experience of the National Consumers' League fight for the ten-hour day for working women, address the secretary of that organization at 106 East 19th Street, New York City.



LEGAL LIMITATION OF WORKING HOURS FOR WOMEN IN THE UNITED STATES

*Indiana prohibits night work in manufacturing. Arizona limits hours to 8 per day in laundries, Montana to 9 per day on telephones in cities of 3,000 or more.
 In some states there is no adequate enforcing authority; in others, as in Oklahoma and South Dakota, the laws are so worded as to make enforcement practically impossible.

HOURS OF LABOR

The following states have no laws regulating the hours of labor for women: Idaho, Iowa, Kansas, Mississippi, Nevada, New

I STATE	II ESTABLISHMENTS	III AGE	IV MAXIMUM HOURS DAY	V HOURS WEEK	VI MEAL TIME
Arizona Laws 1909, C. 100, secs. 1, 3.	Laundries.	All persons.	8 <i>Exceptions:</i> See col. VII.	48	
California Laws 1911, Part 1, C. 258. Declared constitu- tional, Crim. No. 1686. F. A. Mil- ler for a writ of habeas corpus. Labelers, tally- clerks, packers, etc., not excepted. Opinion Attorney General, June 14, 1911.	Manufacturing Mercantile Mechanical Telegraph Telephone Hotels Restaurants Laundries Express Transportation. <i>Exceptions:</i> Harvest- ing, curing, can- ning, and drying of perishable fruit or vegetables.	All females.	8	48	
Colorado Approved by the people, Nov. 5, 1912.	Manufacturing Mechanical Mercantile Laundries Hotels Restaurants.	Over 16.	8		
Connecticut Pub. Acts 1909, C. 220, secs. 1, 5. Pub. Acts 1909, C. 220, secs. 2, 3, 5; Laws 1911, C. 278.	Manufacturing Mechanical. Mercantile.	Over 16. Any age.	10 <i>Exceptions:</i> See col. VII, 1, 2, 3.	58 <i>Exceptions:</i> See col. VII, 4. 58 <i>Exceptions:</i> See col. VII, 1, 2.	
Georgia Laws 1911, No. 279.	Cotton and woolen manufacturing. <i>Exceptions:</i> - Engi- neers, firemen, watch- men, mechanics, team- sters, yard employees, clerical force, repair- men.	All persons.	10 <i>Exceptions:</i> See col. VII.	60 <i>Exceptions:</i> See col. VII.	

FOR WOMEN

any industry : Alabama, Arkansas, Delaware, District of Columbia, Florida
Mexico, Texas, Vermont, West Virginia, Wyoming.

VII OVERTIME ALLOWED	VIII NIGHT WORK PROHIBITED	IX POSTING NOTICES CONTENTS AND EFFECT	X PENALTIES
<p>1. In order to get short day in the week.</p> <p>2. To make repairs to prevent interruption of ordinary running of machinery.</p> <p>3. To make up time lost on previous day of same week by stopping of machinery.</p>		<p>Number of hours required each day. Employment in excess of posted hours is a violation.</p> <p><i>Exceptions:</i> See col. VII, 3.</p>	<p>Any person, corporation, or agent, for violating provisions, \$100-\$300 for each offense.</p>
			<p>Employer or agent who permits or suffers a violation, \$50-\$200, 5-30 days' imprisonment, or both.</p>
			<p>Employer for violating provisions, \$50-\$500, imprisonment for 30 days to 6 months, or both, for each day's violation.</p>
<p>1. In order to get a short day in the week.</p> <p>2. To make repairs to prevent interruption of ordinary running of machinery.</p> <p>3. To make up time lost on previous day of the same week by stopping of machinery.</p> <p>4. Two hours in any week, except in June, July and August. See col. IX, 2.</p>	<p>After 10 p. m.</p> <p><i>Exceptions:</i> Unless 2 shifts employed, in which case no shift to work more than 10 hrs. per day.</p>	<p>1. Number of hours required each day. Employment in excess of posted hours is a violation.</p> <p><i>Exceptions:</i> See col. VII, 3.</p> <p>2. Employer may post notice that hours shall not exceed 55 in any week in June, July and August, if such notice is posted on or before Jan. 1, in order to get overtime during other months of year. See col. VII, 4.</p> <p>Same as above.</p>	<p>Every employer who wilfully violates provisions, not more than \$20 for each offense.</p> <p>Same as above.</p>
<p>1. As (4) above.</p> <p>2. From Dec. 17-25 when employer, during the year, grants 7 holidays with pay.</p>			
<p>To make up lost time, not to exceed 10 days, caused by accident or other unavoidable circumstances.</p>			<p>Cotton or woollen manufacturing establishments making or enforcing any contract in violation, \$20-\$500 for each offense.</p>

HOURS OF LABOR FOR WOMEN

I STATE	II ESTABLISHMENTS	III AGE	IV MAXIMUM DAY	V HOURS WEEK	VI MEAL TIME
Illinois Laws 1911, S. B. 440; amending laws 1909, S. B. 497, secs. 1, 2, and adding sec. 5. Declared constitutional, 91 N. E. R. 695; and 98 N. E. 982.	Mechanical Factories Laundries Hotels Restaurants Mercantile Telegraph Telephone Places of amusement Express Transportation Public utilities Common carriers Public institutions, whether or not in- corporated.	Over 16.	10		
Indiana Anno. Stat. 1908, Rev. 1901, sec. 7087c.	Manufacturing.	Over 16.			60 mins. noon. <i>Exceptions:</i> Shorter time posted permit.
Kentucky Acts 1912, C. 77.	Laundries Bakeries Factories Workshops Stores Mercantile Manufacturing Mechanical Hotels Restaurants Telephone Telegraph.	Over 16.	10	60	
Louisiana Acts 1908, No. 301, secs. 1, 4, 6.	Mills Factories Mines Packing houses Manufacturing Workshops Laundries Millinery Dressmaking Mercantile Any other unhealthful or dangerous occu- pation where more than 5 are em- ployed.	Over 18.	10 <i>Exceptions:</i> See col. VII.	60 <i>Exceptions:</i> See col. VII.	1 hr. at noon. <i>Exceptions:</i> 1. Shorter in if 2/3 employ- no desire, but less than 30 mi- 2. See col. VI 2.
Maine R. S. 1903, C. 40, secs. 49, 50, 56; Laws 1909, C. 70.	Manufacturing Mechanical <i>Exceptions:</i> Perish- able materials or products.	Over 18.	10 <i>Exceptions:</i> See col. VII, 4.	58	

HOURS OF LABOR FOR WOMEN

VII VERTIME ALLOWED	VIII NIGHT WORK PROHIBITED	IX POSTING NOTICES CONTENTS AND EFFECT	X PENALTIES
		Employer must keep record book of hours of each female, open to factory inspector. Maximum penalty for failure to keep such record, or for any false statement, \$25.	Employer for requiring, permitting or suffering violation of provisions, or for permitting or suffering agent to violate, \$25-\$100 for each offense.
	10 p. m.-6 a. m.		Any person for violating or omitting to comply with provisions, not more than \$50 for first offense, and \$100 for second offense, and imprisonment for 10 days may be added; for third offense, not less than \$250 and not more than 30 days.
		1. Copy of law. 2. Hours required each day. 3. Hours of beginning and ending work. (Employer must keep record book for each female.)	Any person or firm violating or suffering or permitting violation of provisions, \$25-\$50 for first offense; \$50-\$200, or imprisonment for 10-90 days, or both, for each subsequent offense.
Stores and mercantile establishments: 4. Saturday nights; 5. During 20 days before Christmas.			Employer or agent, for violating provisions, \$25-\$50, or imprisonment for 20 days to 6 mos., or both.
1. In order to get short in the week. 2. To make repairs to prevent interruption of ordinary running of machinery. 3. To make up time lost on previous day of same week stopping of machinery. 4. Females of 18 or over, not to exceed 6 hrs. a week 60 a year, with additional		1. Number of hours required each day. 2. Exact time of commencing work in morning, stopping at noon, commencing after dinner, and stopping at night. Employment for more than the number of hours posted is violation. Exceptions: See col. VII, 3.	Employer or agent, for having in employment any person in violation of provisions, \$25-\$50 for each offense.

HOURS OF LABOR FOR WOMEN

I STATE	II ESTABLISHMENTS	III AGE	IV MAXIMUM Day	V HOURS Week	VI MEAL TIME
Maryland Acts 1912, C. 79.	Manufacturing Mechanical Mercantile Printing Bakeries Laundries. <i>Exceptions:</i> Prepar- ing or preserving perishable fruits and vegetables.	Over 16.	10	60	Where three or more employes, 1/2 hr. after 6 hr. work, unless 1/2 day's work com- pleted after 6 1/2 hr. work.
Massachusetts Acts 1909, C. 514, secs. 48, 49, 51, 67, 68; amended by Acts 1911, C. 484; Acts 1912, C. 477. Declared constitu- tional, 120 Mass. 383.	Manufacturing Mechanical.	Over 18.	10	54 <i>Exceptions:</i> See col. VII.	One-half hour at end of 6 hrs. <i>Exceptions:</i> When dismissed at ex- piry of 6 1/2 or, if time to eat is given, 7 1/2 hr.
Acts 1909, C. 514, sec. 47.	Mercantile, including restaurants.	Same as above.		58	
Acts 1911, C. 313. Acts 1912, C. 452.	Workshops for alter- ing of repairing gar- ments in connec- tion with retail stores.	Same as above.		56	
Michigan Acts 1909, No. 285, secs. 9, 54; amend- ed by Acts 1911, No. 220. Declared constitu- tional, 128 N. W. 913.	Factories Mills Warehouses Workshops Clothing Dressmaking Millinery Manufacturing Laundries Stores Shops Mercantile <i>Exceptions:</i> For pre- serving perishable goods in fruit and canning establish- ments.	Over 18.	10	54	
Minnesota Acts 1909, No. 285, secs. 9, 54; amend- ed by Acts 1911, No. 220.	Manufacturing Mechanical.	Over 16.	10 <i>Exceptions:</i> See col. VII.	58	1. 60 mins. at noon. <i>Exceptions:</i> Short- er time by postal permit. 2. In case of overtime in excess of 1 hr. after 6 p. m., 20 mins. be- fore beginning work.
Acts 1909, C. 499, secs. 1, 3, 6.	Mercantile.	Same as above.		58	Same as above.
Missouri Laws 1911, S. B. 8, sec. 1.	Manufacturing Mechanical Mercantile Laundries Workshops.	Over 16.	9	54	

HOURS OF LABOR FOR WOMEN

VII OVERTIME ALLOWED	VIII NIGHT WORK PROHIBITED	IX POSTING NOTICES CONTENTS AND EFFECT	X PENALTIES
In seasonal industries, in Allegheny County, 2 hrs. a day for 6 wks. if yearly average for entire force is 9 a day and less than 9 for 4 mos. preceding overtime.	Night work is limited to 8 hrs. in 24, if any part of work falls between 10 p. m. and 6 a. m.	1. Provisions of the law. 2. Hours of beginning and stopping work.	Any person for violating or for hindering inspector, not more than \$100 for first offense; not more than \$1,000, or imprisonment for one year, or both, for subsequent offense.
1. Seasonal industries, 4 hours per week, but total shall not exceed weekly average of 54 hrs. per year. 2. To make up for stopping machinery more than 30 consecutive minutes.	1. Factories, laundries, dress-making, etc., 10 p. m.-6 a. m. 2. Textile factories, 6 p. m.-6 a. m.	1. Number of hours required each day. 2. Hours of commencing and stopping. 3. Hours of beginning and ending meal time. Employment outside posted hours is violation. <i>Exceptions: See col. VII, 2.</i> 1. Number of hours required each day. 2. Hours of commencing and stopping. 3. Time allowed for meals. Employment outside posted hours is violation.	Employer or agent, for (1) employing any person in violation, failure to post notice, or false report of stopping machinery, \$20-\$50. Same as (1) above.
		Copy of sec. 9 must be posted in conspicuous place, near time-clock where one is used.	Any person, for violating or omitting to comply with any provision, \$10-\$100, or imprisonment for 10-90 days, or both.
1. In order to get short day in week. 2. To make up for stopping machinery for more than 30 mins.		1. Number of hours required each day. 2. Hours of beginning and ending meal time. Employment outside of posted hours is a violation. <i>Exceptions: See col. VII, 2.</i> 1. Same as 1 above. 2. Hours of beginning and stopping. 3. Same as 2 above. <i>Effect: Same as above.</i>	Employer or agent violating any provision is guilty of misdemeanor. Same as above.
			Employer, agent or any employee who requires, permits, or suffers a violation, \$25-\$100 for each offense.

HOURS OF LABOR FOR WOMEN

I STATE	II ESTABLISHMENTS	III AGE	IV MAXIMUM DAY	V HOURS WEEK	VI MEAL TIME
Montana Laws 1909, C. 75, sec. 1.	Public telephones in cities of 3000 or over.	Any opera- tor on switch board.	9 <i>Exceptions:</i> See col. VII.		
Nebraska Cobbey's Anno. Stat. 1907, secs. 6940, 6941, 6943. Declared constitu- tional, 65 Neb. 394.	Manufacturing Mechanical Mercantile Hotels Restaurants.	Over 16.	10	60	
New Hampshire P. S. 1891, C. 180, secs. 14, 15, 16; Laws 1907, C. 94.	Manufacturing Mechanical.	Over 18.	9 hrs. and 40 mins. <i>Exceptions:</i> See col. VII.	58	
New Jersey Laws 1912, C. 216, Laws 1911, C. 273.	Manufacturing Mercantile Bakeries Laundries Restaurants. <i>Exceptions:</i> Mercan- tile establishments during six working days preceding Christmas. Cann- eries engaged in pack- ing perishable pro- ducts.	Over 16.	10	60, and six days.	At least 30 min. after 6 hrs. work except on Satur- day.
New York Laws 1912, C. 539; Laws 1909, C. 36, art. 6, sec. 89.	Workshops Mills Manufacturing. Laundries Business establish- ments employing one or more. <i>Exceptions:</i> Canning and preserving per- ishable products, June 15-Oct. 15 each year.	Over 16.	9 <i>Exceptions:</i> See col. VII.	54, and six days	1. 60 mins. at noon. 2. If overtime, 20 mins. before be- ginning work. <i>Exceptions:</i> Shorter time by permit.
North Carolina Laws 1911, C. 85.	Manufacturing. <i>Exceptions:</i> Mechan- ics, engineers, fire- men, overseers, yard and office men.	Any person.		60	
North Dakota Rev. Code, 1905, sec. 9440.	Workshops Mechanical Manufacturing.	Over 18.	10		

HOURS OF LABOR FOR WOMEN

VII OVERTIME ALLOWED	VIII NIGHT WORK PROHIBITED	IX POSTING NOTICES CONTENTS AND EFFECT	X PENALTIES
To relieve another employee in case of sickness, or for other unforeseen cause.			Employer for employing any person longer hours, \$100-\$500 for each day's violation.
	10 p. m.-6 a. m. Declared constitutional, State of Nebraska vs. Chas. Prenica, Dist. Ct. of Douglas Co.	1. Number of hours required each day. 2. Hours of commencing and stopping. 3. Hours of commencing and ending meal time.	Employer of agent, for violating any provision, \$20-\$50 for each offense.
1. To get short day in week. 2. To make repairs to prevent interruption of ordinary running of machinery. 3. To make up time lost on previous day of same week by stopping of machinery.		1. Number of hours required each day. 2. Exact time of beginning and ending.	Owner or agent, for wilful violation of any provision, not more than \$50 for each offense.
		1. Abstract of law. (Employer must keep record of hours of each employee.) 2. Meal hours.	Whoever employs or permits violation of provisions, \$25-\$50 for first offense; \$50-\$200 for second offense. Any employer for violating meal-time provisions, \$100 for first offense; \$200 for each subsequent offense.
One hour a day but total not to exceed 54 hours a week for females 16 or over.	9 p. m.-6 a. m. Declared unconstitutional as to adults, 189 N. Y. 131.	1. Number of hours required each day. 2. Time of beginning and ending. <i>Effect:</i> Presence in factory outside of posted hours, prima facie evidence of violation. <i>Exceptions:</i> Posted permit granted by Commissioner of Labor, if daily hours are posted and time book for each employee is kept.	Any person permitting violation or failing to comply with provisions, first offense \$20-\$50; second offense \$50-\$250, or not more than 30 days, or both; third offense not less than \$250, or not more than 60 days, or both.
			Any mill owner, superintendent, or manufacturing establishment knowingly violating provisions is guilty of misdemeanor.
			Employer or agent, for compelling violations, \$10-\$100.

HOURS OF LABOR FOR WOMEN

I STATE	II ESTABLISHMENTS	III AGE	IV MAXIMUM DAY	V HOURS WEEK	VI MEAL TIME
Ohio Laws 1911, S. B. 11, p. 488. Declared constitutional, 98 N. E. 1126.	Factories Workshops Restaurants Telephone Telegraph Millinery Dressmaking Distribution or transmission of messages. <i>Exceptions:</i> Canning and establishments for preparation of perishable goods.	Over 18.	10	54	Not less than 30 mins. where lunch room is provided; otherwise, 60 mins. during which women employees may leave bathing.
Oklahoma Comp. Laws, 1909, C. 56, secs. 4027, 4040.	Manufacturing Factories Workshops.	Over 18.	10		
Oregon Laws 1907, C. 200, sec. 2; 1909, C. 138, sec. 1, Declared constitutional, 208 U. S. 412.	Mechanical Manufacturing Mercantile Laundries Hotels Restaurants Telephone Telegraph Express Transportation.	Over 16.	10	60	
Pennsylvania Laws 1905, No. 226, secs. 1, 3, 9, 10, 23. Declared constitutional, 15 Pa. Sup. Ct. 5.	Any establishment except domestic service, mining and farming.	Over 18.	12	60	1 hr. at noon. <i>Exceptions:</i> Shorter time by permit.
Rhode Island G. L. 1896, C. 198, secs. 22, 23; Acts 1902, C. 994; Acts 1909, C. 384.	Manufacturing Mechanical.	Over 16.	10 <i>Exceptions:</i> See col. VII.	56	
South Carolina Acts 1907, No. 233; Acts 1909, No. 121. Laws 1911, C. 83.	Cotton and woolen manufacturing. <i>Exceptions:</i> Mechanics, engineers, firemen, &c. Mercantile.	Over 16. Any age.	11 <i>Exceptions:</i> See col. VII. 12	60 60	

HOURS OF LABOR FOR WOMEN

VII OVERTIME ALLOWED	VIII NIGHT WORK PROHIBITED	IX POSTING NOTICES CONTENTS AND EFFECT	X PENALTIES
			Employer or agent, for violating provisions, \$25-\$200.
		Hours between which work is required each day.	Employer or agent, for compelling violation, \$10-\$100.
			Employer or agent, for permitting or suffering violation, \$25-\$100 for each offense.
		1. Copy of factory laws. 2. Number of hours required each day.	Any person violating or permitting violations, \$25-\$500, or 10-60 days, for each offense.
1. To get a short day in week. 2. To make repairs to prevent interruption of ordinary running of machinery. 3. To make up time lost on a previous day of same week by stopping of machinery.		Number of hours required each day.	Employer, for wilfully employing or having in employment or under charge in violation of provisions, not more than \$20 for each offense.
To make up lost time caused by accident or unavoidable cause, not to exceed a total of 60 hrs. per year.	After 10 p. m.		Any person, for entering into or enforcing contracts for longer hours, \$25-\$100, or imprisonment for not more than 30 days, for each offense. Any employer violating provisions or "requiring" work after 10 p. m., \$10-\$40, or imprisonment from 10-30 days.

HOURS OF LABOR FOR WOMEN

I STATE	II ESTABLISHMENTS	III AGE	IV MAXIMUM DAY	V HOURS WEEK	VI MEAL TIME
South Dakota Anno. Stat. 1903, Penal Code, sec. 764.	Workshops Mechanical Manufacturing.	Over 18.	10		
Tennessee Laws 1907, C. 308.	Manufacturing.	Over 16.		60	
Utah Laws 1911, C. 133.	Manufacturing Mechanical Mercantile Telegraph Telephone Laundries Hotels Restaurants Hospitals Express Transportation Offices.	Over 16.	9	54	
Virginia Code 1904, C. 178a, sec. 2657b; amended by Acts 1912, C. 248.	Factories Manufacturing Workshops Mercantile in towns of 2000 or over (ex- cept Saturdays). <i>Exceptions:</i> 1. Book- keepers, stenogra- phers, cashiers, of- fice assistants. 2. Factories for pack- ing fruits or vege- tables, between July 1 and Nov. 1.	Over 14.	10		
Washington Laws 1911, C. 37. Declared constitu- tional, P. R. 122, p. 324.	Mechanical Mercantile Laundries Hotels Restaurants. <i>Exceptions:</i> Harvest- ing, packing, curing, canning or drying of perishable fruits, vegetables or fish.	All females.	8		
Wisconsin Laws 1911, C. 548.	Manufacturing Mechanical Mercantile Laundries Restaurants Confectionery stores Telegraph Telephone Express Transportation.	Over 16.	10 See col. VIII.	55	1 hour.

HOURS OF LABOR FOR WOMEN

VII OVERTIME ALLOWED	VIII NIGHT WORK PROHIBITED	IX POSTING NOTICES CONTENTS AND EFFECT	X PENALTIES
			Employer or agent, for compelling violation, \$10-\$100.
			Person, firm or corporation, for employing in excess of hours, \$25-\$100 for each offense.
Emergencies in hospitals; where life or property is in imminent danger; or if materials are liable to spoil.			Employer or any person requiring or employing for longer than time stated, \$25-\$100 and costs.
			Any person engaging or contracting for overtime, \$5-\$20.
		Copies of act must be posted in every room where women are employed, in an open and conspicuous place. Form prescribed by Com. of Labor.	Employer or agent who violates provisions, \$10-\$100 for each offense.
	Night work is limited to 8 hrs. in 24, and 48 per week, if any part of work falls between 8 p. m. and 6 a. m. on more than one night a week.	1. Hours of beginning and stopping work. 2. Hours of meal time. 3. Maximum number of hours per day. Employment at any time other than posted is prima facie evidence of violation.	Any person violating provisions, \$5-\$100.

PROHIBITED EMPLOYMENTS FOR WOMEN

In addition to those states which prohibit the employment of women in mines and saloons, New York forbids the employment of women at any abrasive or emery-polishing or buffing wheels, where articles of the baser metals or of iridium are manufactured. Louisiana, West Virginia and Missouri forbid the cleaning of moving machinery by women, and Arizona this year excluded women from those employments which require constant standing.

The following states prohibit the employment of women in—

MINES	SALOONS
Alabama	Arizona
Arizona	Connecticut
Arkansas	Idaho
Colorado	Iowa
Illinois	Louisiana
Indiana	Maryland
Maryland	Michigan
Missouri	Missouri
New York	Montana
Oklahoma	New Hampshire
Pennsylvania	New Mexico
Utah	New York
Virginia	Texas
Washington	Utah
West Virginia	Vermont
Wyoming	Washington

CORE ROOMS

In Massachusetts, the state board of health is directed to investigate the core rooms where women are employed and to make rules relating to the structure and location of such rooms, the emission of gases and fumes from ovens, and the size and weight of material which women may be allowed to lift or work upon. A copy of the rules must be posted in every core room where women are employed. The penalty for a violation of such rules is from \$25 to \$500.

CHILDBIRTH PROTECTION

Two American states have enacted laws for the protection of working women at the time of childbirth. Massachusetts in 1911 enacted a measure making it unlawful knowingly to employ a woman in manufacturing, mercantile or mechanical establishments for two weeks before or for four weeks after childbirth. A maximum penalty of \$100 is imposed in case of violation.

New York in 1912 prohibited the employment of women in factories, mercantile establishments, mills or workshops for four weeks after childbirth. The penalty for a first offense is \$20 to \$50; for a second offense \$50

to \$250, or imprisonment for not more than thirty days, or both; for a third offense \$250, or imprisonment for sixty days, or both.

Practically all foreign countries have similar legislation, and England, Germany, Austria, Italy and Norway provide insurance for women compelled by this legislation to take a rest-period.

THE MINIMUM WAGE

Only one American state has enacted minimum wage legislation. Massachusetts in 1912 provided for the establishment of a commission which is to appoint wage boards for any industry where it has reason to believe a minimum wage should be established. The commission has no power to compel the adoption of the wage determined upon by the board, but may publish the names of those employers who refuse to pay the proposed minimum. Massachusetts also prohibits the imposition of fines for imperfect weaving in textile mills.

Minimum wage boards have been in operation in New Zealand and Victoria for several years, and in England since 1910. They were also provided for in Germany in 1912.

SEATS, TOILETS AND DRESSING-ROOMS

The following states have no special provisions for women on any of these subjects: Arkansas, Idaho, Mississippi, Montana, Nevada, New Mexico, North Dakota, South Dakota, Texas, and Vermont.

Penalties for violations range usually from \$10 to \$100, and in some cases include a short term of imprisonment. Several states increase the penalty for second or subsequent offenses. In many states the law relating to seats specifies that employers must permit the use of seats when work will not thereby be interfered with. In some cases, as in the city of Baltimore, no provision is made for the enforcement of the law. In a few states, such as Delaware, Minnesota, Missouri and Louisiana, special provisions as to cleanliness and safety are required where women and children are employed.

Alabama—Seats: Proper accommodations for sitting or resting required in stores or shops where any female is employed as clerk or saleswoman. Cd. 1907, sec. 6857.

Toilets: Suitable toilets, separate and apart for each sex, must be provided in mills, factories and manufacturing establishments; fresh drinking water and fresh air must also be supplied. Cd. 1907, sec. 6438.

Dressing-rooms: No special provisions for women.

Arizona—Seats: Two suitable chairs to every three females must be provided in mills, factories, workshops, mercantile establishments, tenement-house manufactories or workshops, stores, telegraph or telephone offices, restaurants, bakeries, apartment houses, barber shops, bootblack stands or parlors, and in messenger service. Laws 1912, C. 32, sec. 6.

Toilets: No special provisions for women.

Dressing-rooms: No special provisions for women.

California—Seats: Suitable seats required in all establishments which employ females. Acts 1911, Pt. 1, C. 258, sec. 2. This act takes precedence over the earlier law which required employers in manufacturing, mercantile and mechanical establishments to provide suitable seats, one for each three employees.

Toilets: No special provisions for females, but required in all places employing 5 or more persons.

Dressing-rooms: No special provisions for women.

Colorado—Seats: Suitable seats required in manufacturing, mechanical or mercantile establishments. A. S., secs. 3604-3605.

Toilets: Required in factories, workshops, offices, bakeries, laundries, stores, hotels, or other buildings where four or more persons are employed; a sufficient number must be provided, separate for each sex, plainly marked, and kept at all times properly screened and ventilated and in good sanitary condition. Acts 1909, C. 166, sec. 10.

Dressing-rooms: Separate rooms may be required by the factory inspector whenever a change of clothing is necessary. Acts 1909, C. 166, sec. 10.

Connecticut—Seats: Suitable seats required in manufacturing, mercantile, or mechanical establishments employing females. G. S. 1902, sec. 4703.

Toilets: No special provisions for women, but required in factories or other buildings where five or more are employed.

Dressing-rooms: No special provisions for women.

Delaware—Seats: Suitable seats required in manufacturing, mechanical or mercantile establishments. R. C. 1893, C. 127. Required of every storekeeper in New Castle Co. Acts 1897, C. 452.

Toilets: Required wherever ten or more females are employed in New Castle Co., separate for each sex. Acts 1897, C. 452.

Dressing-rooms: Required in establishments mentioned under "Toilets", with one washing sink for every 15 females. Acts 1897, C. 452.

District of Columbia—Seats: Suitable seats required in stores, shops, offices, or manufactories. Acts 1894-95, C. 192.

Toilets: Required in all buildings where both sexes are employed. Acts 1897-98, C. 8, sec. 9.

Dressing-rooms: No special provisions for women.

Florida—Seats: Required of employers of female assistants in mercantile or other business pursuits. G. S., sec. 3253.

Toilets: No special provisions for women.

Dressing-rooms: No special provisions for women.

Georgia—Seats: Suitable seats required in manufacturing, mechanical or mercantile establishments. Cd. 1895, Vol. III, sec. 127.

Toilets: No special provisions for women.

Dressing-rooms: No special provisions for women.

Illinois—Seats: Suitable seats required in all establishments subject to factory inspection. R. S. 1905, C. 48, sec. 36. In factories, mercantile establishments, mills or workshops, a reasonable number of suitable seats must be provided and made a permanent fixture. Laws 1909, p. 202, sec. 9.

Toilets: Required in factories, mercantile establishments, or workshops. There must be one for every 25 women, separate for each sex, plainly marked, properly enclosed, and lighted; and where practicable they must have direct outside ventilation. Washing facilities with one spigot and basin for each 30 employees (in mercantile establishments one for each 50 employees) must be provided, separate for each sex. Laws 1909, p. 202, secs. 20, 21. In specified dangerous trades, lavatories are required with a sufficient number of basins, hot and cold water, clean towels, soap, and shower baths. Laws 1911, p. 330, sec. 6.

Dressing-rooms: Required in establishments listed under "Toilets", where change of clothing is necessary, suitable and separate for each sex. Laws 1909, p. 202, secs. 20, 21. In specified dangerous trades dressing-rooms must be provided with compartments for clothes of employees; and suitable provision is required for taking meals outside of work-rooms. Laws 1911, p. 330, secs. 6, 7.

Indiana—Seats: Suitable seats required in establishments listed under "Toilets", employing women or girls. A. S., secs. 2246, 7087j.

Toilets: Required in manufacturing and mercantile establishments, renovating works, bakeries and printing offices; there must be one for every 25 employees and "one for each fraction thereof above ten", separate for each sex, properly screened and ventilated. A. S., sec. 7087j.

Dressing-rooms: May be required in above establishments by chief factory inspector. A. S., sec. 7087j.

Iowa—Seats: Required in mercantile or manufacturing businesses or occupations. Code 1897, Sup. 1902, sec. 4999.

Toilets: One for every 20 employees in manufacturing establishments, workshops, and hotels, where five or more are employed; must be separate for each sex, screened, ventilated, kept clean and free from obscene markings. Laws 1911, C. 171.

Dressing-rooms: In factories, mercantile establishments, mills and workshops adequate washing facilities must be provided, and where a change of clothing is necessary dressing-rooms, separate for each sex, with a sufficient supply of pure drinking water, must be maintained. Laws 1911, C. 171.

Kansas—Seats: Required in all places where women are employed. G. S. 1901, sec. 3842.

Toilets: No special provisions for women.

Dressing-rooms: No special provisions for women.

Kentucky—Seats: Required in all places where females are employed; in stores and mercantile establishments, one for every three employed. Seats that fold are not deemed a compliance with the law. Acts 1912, C. 77.

Toilets: Required in all establishments employing females, screened, ventilated and free from obscene markings; where males are also employed, toilets must be in separate rooms with separate entrances. Acts 1912, C. 77.

Dressing-rooms: Required where nature of work makes change of clothing necessary. Acts 1912, C. 77.

Louisiana—Seats: One for every three females required in all establishments employing females. Acts 1908, No. 301, sec. 13.

Toilets: One for each 25 employees in establishments employing at least two children or women, separate and apart for each sex. Laws 1908, No. 301, sec. 14.

Dressing-rooms: Required in establishments mentioned under "Toilets". Laws 1908, No. 301.

Maine—Seats: Comfortable seats required where females are employed. Laws 1911, C. 26.

Toilets: No special provisions for women.

Dressing-rooms: No special provisions for women.

Maryland—Seats: Required in places where females are employed "for serving the public"; a suitable seat for each female employee. Pub. Gen. Laws, Code 1903, Art. 27, sec. 230; amended, Acts 1904, C. 287. In Baltimore every employer of females in mercantile and manufacturing establishments must maintain suitable seats. Pub. Loc. Laws, Code 1888, Art. 4, sec. 505.

Toilets: No special provisions for women.

Dressing-rooms: No special provisions for women.

Massachusetts—Seats: Required in manufacturing, mechanical or mercantile establishments; and their use permitted at work which can be done while sitting. Acts 1912, C. 96.

Toilets: Required in all establishments or offices employing two or more females, separate for each sex. Acts 1909, C. 514, sec. 79.

Dressing-rooms: No special provisions for women.

Michigan—Seats: Suitable seats required in stores, shops, offices, and manufactories. Females must not be unnecessarily required to stand constantly at any occupation. Acts 1909, No. 285, secs. 24, 11.

Toilets: Required in manufacturing establishments, workshops, hotels and stores employing one or more females, separate for each sex, in the ratio of one to every 25 employees. Acts 1909, No. 285, sec. 17.

Dressing-rooms: Required in establishments mentioned under "Toi-

lets" where five or more persons are employed, and in institutions where two or more children or women are employed. Sleeping rooms for female help in hotels must be heated and ventilated. Acts 1909, No. 285, sec. 17.

Minnesota—Seats: Suitable seats required in mercantile and manufacturing establishments, hotels and restaurants. R. L. 1905, sec. 1802.

Toilets: One for every 25 employees required in all places where labor is employed; must be separate for each sex, properly screened and kept in a sanitary condition. Laws 1911, C. 288.

Dressing-rooms: Separate dressing-rooms required in all places where labor is employed and where change of clothing is necessary. Laws 1911, C. 288.

Missouri—Seats: Required in all establishments employing women, in sufficient numbers and conveniently located. R. S. 1899, sec. 6443.

Toilets: Separate toilets required in establishments where both sexes are employed (R. S. 1899, sec. 6441); and in workshops where at least five women or children are employed (R. S. 1899, sec. 10100).

Dressing-rooms: Required in establishments employing women, where unclean work of any kind is performed. R. S. 1899, sec. 6440.

Nebraska—Seats: Suitable seats required in manufacturing, mechanical or mercantile establishments, hotels and restaurants. C. S., Pt. III, sec. 6942 c.

Toilets: One for every 20 employees of each sex required in all buildings where eight or more are employed; must be separate, enclosed, sanitary and well ventilated. Laws 1911, C. 67.

Dressing-rooms: Separate dressing-rooms required in places where the character of the work makes change of clothing desirable. Laws 1911, C. 67.

New Hampshire—Seats: Suitable seats required in manufacturing, mechanical or mercantile establishments. Acts 1895, C. 16.

Toilets: No special provisions for women.

Dressing-rooms: No special provisions for women.

New Jersey—Seats: Suitable seats required in manufacturing, mechanical, or mercantile establishments. P. L. 1884, p. 22; amended, P. L. 1898, p. 440. Required in every commercial business employing women. Laws 1909, C. 147.

Toilets: Required in mercantile establishments, factories, workshops and mills, separate for each sex, screened, ventilated and kept clean. Laws 1911, C. 136; Laws 1904, C. 64, sec. 23.

Dressing-rooms: May be required by Commissioner of Labor.

New York—Seats: Suitable seats required in factories and for waitresses

in hotels and restaurants. R. S., 2092, sec. 17. One for every three females required in mercantile establishments. R. S., p. 2114, sec. 170.

Toilets: Suitable wash-rooms and water closets required in factories and mercantile establishments, properly screened and ventilated, kept clean, free from obscene markings, and separate for each sex. Laws 1911, C. 866; Laws 1910, C. 229.

Dressing-rooms: Required where females are employed; must be provided with at least one outside window and enclosed with solid walls. Laws 1910, C. 229.

North Carolina—Seats: Suitable seats required in stores, shops, offices or manufacturing establishments (wording ambiguous). Laws 1909, C. 857.

Toilets: No special provisions for women.

Dressing-rooms: No special provisions for women.

Ohio—Seats: Suitable seats, with automatic back supports, one for each female, required in all establishments employing females. Laws 1911, S. B. 11, p. 488.

Toilets: Required in buildings where females are employed; one for every 25, ventilated, separate for each sex, on same floor, or floor immediately above or below place of employment; must not be placed in basement unless women are regularly employed there and must then be properly ventilated. In cities without waterworks and sewage systems closets must be located outside of building not more than 50 nor less than 25 feet away (unless dry-closet system, in good sanitary condition, is used). Laws 1911, S. B. 11, p. 488.

Dressing-rooms: Requirements same as for toilets. Separate lunch rooms required where practicable. Laws 1911, S. B. 11, p. 488.

Oklahoma—Seats: Required in all places where females are employed as clerks. Laws 1907-1908, Art. V, p. 499, secs. 17-18.

Toilets: No special provisions for women.

Dressing-rooms: No special provisions for women.

Oregon—Seats: Suitable seats required in all establishments employing any female. Penalty \$25-\$100 for each offense. Acts 1907, C. 200.

Toilets: No special provisions for women.

Dressing-rooms: No special provisions for women.

Pennsylvania—Seats: Suitable seats required wherever females are employed. Acts 1905, No. 226, sec. 7.

Toilets: Suitable closets must be provided wherever both sexes are employed, separate, screened, well ventilated and clean. Acts 1905, No. 226, sec. 8.

Dressing-rooms: Same as "Toilets".

Rhode Island—Seats: Convenient seats required in mechanical and mercantile establishments. G. L. 1896, C. 40, sec. 8.

Toilets: Required in all places employing women. G. L. 1896, C. 68, sec. 8.

Dressing-rooms: Separate dressing-rooms required when deemed necessary by inspectors. G. L. 1896, C. 68, sec. 8.

South Carolina—*Seats:* One suitable seat for every three females required in stores. Code 1902, sec. 333.

Toilets: No special provisions for women.

Dressing-rooms: No special provisions for women.

Tennessee—*Seats:* One seat required for each employee in establishments employing saleswomen. Acts 1905, C. 171.

Toilets: Separate toilets required in manufacturing and mercantile establishments. Acts 1897, C. 98.

Dressing-rooms: No special provisions for women.

Utah—*Seats:* Required in all places where girls or women are employed. C. L. 1907, sec. 1339.

Toilets: No special provisions for women.

Dressing-rooms: No special provisions for women.

Virginia—*Seats:* One for every three female employees in mercantile establishments. Acts 1910, C. 189.

Toilets: Required in all establishments or offices employing two or more women; separate where one of each sex is employed. (Offices having separate and convenient toilets are excepted). Acts 1912, C. 62.

Dressing-rooms: No special provisions for women.

Washington—*Seats:* A seat required for every female employed in stores, offices or schools. Codes and St. 1897, sec. 7287. In all establishments where females are employed suitable seats must be provided and a notice of the law posted. Acts 1911, C. 37.

Toilets: No special provisions for women.

Dressing-rooms: No special provisions for women.

West Virginia—*Seats:* In all establishments where women are employed a sufficient number of comfortable seats, conveniently located, must be provided. Acts 1901, C. 19.

Toilets: Required in all establishments where both sexes are employed. Acts 1901, C. 19.

Dressing-rooms: Required in all establishments employing women where unclean work of any kind is done. Acts 1901, C. 19.

Wisconsin—*Seats:* Suitable seats required in manufacturing, mechanical and mercantile establishments. A. S. sec. 17281.

Toilets: Required in factories, mills, workshops, mechanical or manufacturing establishments, and in buildings where eight or more persons

are employed; must be separate and apart for each sex, properly enclosed, ventilated and kept clean; and must be provided in the ratio of one for every 20 employees. A. S., sec. 1636-31.

Dressing-rooms: May be required by the Industrial Commission where change of clothing is necessary. A. S., sec. 1636-32. Separate dressing-rooms are required in cigar factories where both sexes are employed. A. S., sec. 1636-107.

Wyoming—Seats: Suitable seats required in manufacturing, mechanical or mercantile establishments. Acts 1901, C. 33.

Toilets: No special provisions for women.

Dressing-rooms: No special provisions for women.

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EFFICIENT ENFORCEMENT OF LABOR LAWS

Immediate Legislative Program: Prepare for the supreme test of law enforcement by helping to develop machinery for more efficient factory inspection and better enforcement of labor laws.

A study of the administration of labor laws in the United States¹ reveals a tendency to hasty and ill-considered statutory enactment. Too often the purpose of laws, passed in response to popular demand, is defeated through failure to provide adequate means of enforcement. Too often, where sufficient machinery has been provided, men wholly unfitted for the particular task are designated as enforcing officers, rendering the legislation almost ineffectual. Wherever good laws are on the statute books but the administrative machinery is weak, the community, though ethically the better, is actually disappointed in that only the minimum benefits are being derived from promising opportunities. It behooves us, therefore, to take an inventory of our legal possessions in this field and examine carefully wherein our administrative forces can be permanently strengthened.

ORGANIZATION OF ADMINISTRATIVE AUTHORITIES

Broadly grouped, authority to administer labor laws (exclusive of laws governing mines), and to inspect factories in the United States is vested in—

- (a) *Departments of Labor,*
Bureaus of Labor, including Factory Inspection and
Labor Statistics:

California, Colorado, Georgia, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Michigan, Minnesota, Montana, Nebraska, New York, North Carolina, North Dakota, Oklahoma, Oregon, South Carolina, Texas, Utah, Virginia, Washington, West Virginia;

¹*Administration of Labor Laws, Legislative Review No. 3, American Association for Labor Legislation, 1909.*

(b) *Departments of Factory Inspection:*

Delaware, Illinois, Indiana, Missouri, Pennsylvania, Rhode Island, Tennessee, Connecticut, Ohio, New Jersey;

(c) *Commissions or Boards:*

Massachusetts,² Wisconsin;

(d) *Miscellaneous:*

Alabama, District of Columbia, Mississippi.

In the following states there is no provision for the enforcement of labor laws, other than those governing mines:

Arizona, Arkansas, Florida, Idaho, Nevada, New Hampshire, New Mexico, South Dakota, Vermont, Wyoming.

Within each of the foregoing groups there are great variations. The bureau of labor statistics, while in many states exercising the same powers as a department of labor, was originally organized as a statistical laboratory. Subsequent statutory enactment, however, broadened its scope to include factory inspection. There are also great extremes of organization to be observed. On the one hand is the highly organized New York state department with its five separate bureaus³ and one hundred and thirty-five field inspectors, and on the other hand are departments in Georgia, Montana, Nebraska, North Carolina, North Dakota, and West Virginia which have no field inspectors.

In the second classification (b) the variation is also pronounced. On the one hand is Illinois, well organized with its thirty trained civil-service field inspectors, and on the other are Delaware and Tennessee, each with a single inspector and no organization whatever. The Illinois Department of Factory Inspection is in a measure doing work similar to that of the New York Department of Labor.

When we reach the third group (c) we come to a parting of the ways. In Wisconsin authority is vested in an industrial commission,⁴ composed of three paid members and a staff of inspectors who

² To go into effect June 1, 1913. See report of Massachusetts Commission to investigate Inspection of Factories, January, 1911.

³ Bureaus of (1) factory inspection, (2) labor statistics, (3) mediation and arbitration, (4) industries and immigration, (5) mercantile inspection.

⁴ See *Bulletin of the Industrial Commission of Wisconsin*, Vol. I, No. 4, August 20, 1912.

devote all of their time to this work. The rulings of the commission as regards many phases of industrial life have the force of law. It holds hearings, and among other things establishes standards of safety and sanitation. The members of the commission are appointed by the governor, and inspectors are qualified only after a civil-service test. The new Massachusetts plan provides for an advisory board appointed by the governor, this board appointing the labor commissioner.

A miscellaneous group comprises Alabama, where the state inspector of jails, almshouses and factories is required to visit industrial establishments; the District of Columbia, where the federal commissioners designate two child labor inspectors; and Mississippi, where the sheriff is empowered to enforce the law.

The purposes to be accomplished by the various groups are practically the same, but the differences in equipment between states are marked.

METHODS OF CHOOSING THE CHIEF ENFORCING AUTHORITIES

Appointed by the Governor:

Alabama, California, Connecticut, Illinois, Indiana, Iowa, Maine, Maryland, Michigan, Minnesota, Missouri, Montana, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Tennessee, Washington, West Virginia.

Elected by the People:

Kentucky, Oregon, South Carolina and Georgia.

Miscellaneous:

Colorado.—Secretary of state is ex officio commissioner, and appoints a deputy who is acting commissioner.

Delaware.—Chief justice of supreme court appoints inspector.

Louisiana.—In New Orleans the mayor appoints inspector; outside of New Orleans the police jury may designate.

Nebraska.—The governor is the commissioner, acting through a deputy appointed by him.

Kansas.—Commissioner is elected by the delegates of the state society of labor and industry.

Massachusetts.—The board of labor and industries, which is appointed by the governor, designates the commissioner (In effect, March 1, 1913.)

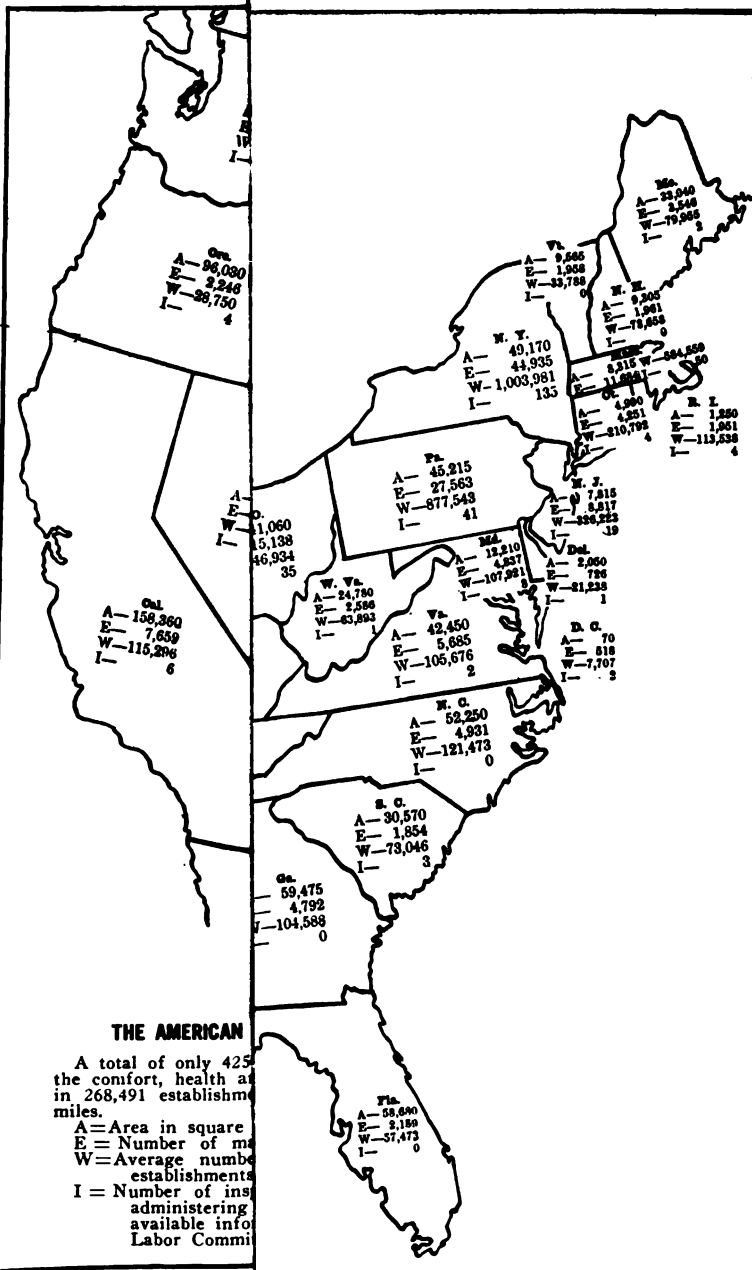
Wisconsin.—The industrial commission, appointed by the governor, acts through its inspectors.

INADEQUACY OF INSPECTORIAL STAFFS IN THE UNITED STATES

It is doubtful whether a single state department in this country has an inspection staff adequate for the amount of work to be done. The following table^a demonstrates this fact:

State	Area in Square Miles	Number Manufacturing Establishments	Average Number Wage Earners	Number Inspectors
Alabama	52,250	3,398	72,148	2
Arizona	113,020	311	6,441	0
Arkansas	53,850	2,925	44,982	0
California	158,360	7,659	115,296	6
Colorado	103,925	2,034	28,067	4
Connecticut	4,990	4,251	210,792	4
Delaware	2,050	726	21,238	1
District of Columbia.....	70	518	7,707	2
Florida	58,680	2,159	57,473	0
Georgia	59,475	4,792	104,588	0
Idaho	84,800	725	8,220	0
Illinois	56,650	18,026	465,764	30
Indiana	36,350	7,969	186,984	6
Iowa	56,025	5,528	61,635	2
Kansas	82,080	3,435	44,215	2
Kentucky	40,400	4,776	65,400	2
Louisiana	48,720	2,516	76,165	1
Maine	33,040	3,546	79,955	2
Maryland	12,210	4,837	107,921	8
Massachusetts	8,315	11,684	584,559	50
Michigan	58,915	9,159	231,499	16
Minnesota	83,365	5,561	84,767	13
Mississippi	46,810	2,598	50,384	0
Missouri	69,415	8,375	152,993	7
Montana	146,080	677	11,655	0
Nebraska	77,510	2,500	24,336	0

^a In this table the figures in regard to the number of manufacturing establishments and the average number of wage-earners are derived from the *Thirteenth (1910) Census Bulletin: Manufactures, United States*. The data in regard to the number of inspectors were furnished by the National Child Labor Committee during the summer of 1912. It should be noted that in most states, in addition to manufacturing establishments, the work of inspection includes mercantile establishments, hotels, restaurants, and laundries, and in some it includes other industries which are not carried on in manufacturing establishments and are therefore not covered by the statistics of establishments and wage-earners here given.



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State	Area in Square Miles	Number Manufacturing Establishments	Average Wage Earners	Number Inspectors
Nevada	110,700	177	2,257	0
New Hampshire	9,305	1,961	78,658	0
New Jersey	7,815	8,817	326,223	19
New Mexico	122,580	313	4,143	0
New York	49,170	44,935	1,003,981	135
North Carolina	52,250	4,931	121,473	0
North Dakota	70,795	752	2,789	0
Ohio	41,060	15,138	446,934	35
Oklahoma	70,057	2,310	13,143	2
Oregon	96,030	2,246	28,750	4
Pennsylvania	45,215	27,563	877,543	41
Rhode Island	1,250	1,951	113,538	4
South Carolina	30,570	1,854	73,046	3
South Dakota	77,650	1,020	3,602	0
Tennessee	42,050	4,609	73,840	1
Texas	265,780	4,588	70,230	1
Utah	84,970	749	11,785	1
Vermont	9,565	1,958	33,788	0
Virginia	42,450	5,685	105,676	2
Washington	69,180	3,674	69,120	5
West Virginia	24,780	2,586	63,893	1
Wisconsin	56,040	9,721	182,583	13
Wyoming	97,890	268	2,867	0
Totals	3,024,507	268,491	6,615,046	425

That we have the ridiculously small number of 425 inspectors in the whole country* to care for 268,491 manufacturing and mechanical establishments, spread over an area of 3,024,507 square miles, and engaging an average of 6,615,046 wage-earners, is a challenge to the sincerity of the communities engaged in this attempt to secure industrial justice.

INSPECTORIAL EFFICIENCY

Not only are there entirely too few inspectors in the United States, if labor laws are to be properly administered; we must, obviously, have inspectors fitted to do the work. The increasingly technical

*Of these 425 inspectors, 352, or about 83 per cent, are divided among nine states,—New York, Pennsylvania, Wisconsin, Ohio, Illinois, Massachusetts, Michigan, Minnesota and New Jersey.

specialization of factory inspection demands expert service. Accident prevention, sanitation, ventilation, occupational diseases, safety, workmen's compensation—these are scientific problems, and the untrained inspector cannot cope with them effectively.

Training Required in the United States

In Alabama, the inspector of jails, almshouses and factories, who is empowered to enforce the labor laws, must be a physician. In Kentucky the inspector must have practical knowledge of machine and workshops. In Minnesota, practical experience and knowledge of the operation of factories is required. In Ohio inspectors must be competent practical mechanics. Indiana requires ten years' practical experience. Only in Illinois, Massachusetts, New York, New Jersey and Wisconsin are inspectorial offices under civil-service rules.

No training whatever is required in California, Colorado, Connecticut, Delaware, Iowa, Kansas, Louisiana, Maine, Maryland, Michigan, Missouri, Montana, Nebraska, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Washington, and West Virginia.

Training in Europe¹

In most of the German states, in Austria, Spain, Finland, Hungary, Luxemburg, and Norway, candidates for inspectorial positions must show that they have had a technical or university education and several years' practical experience.

Prussia: A candidate here is required to have had at least three years' technical training; must have studied law and political economy for at least a year and a half; and must have passed a ninth grade secondary school test. He must then have a year and a half of training under the industrial authorities, at the end of which he is given a test on this training. After successful completion of the training period, he is required to pass a second examination, and for this purpose he must attend a German high school for three terms in order to study law and economics with special reference to industrial administration, industrial hygiene, and public welfare.

Saxony: Here the candidate must not be too old; must be in good physical condition; must have a thorough general education; and must have passed successfully an examination of a technical high

¹ *First Comparative Report of the Administration of Labor Laws.* Publication, International Association for Labor Legislation (1911).

school or of an academy for machine engineers, electrical engineers, railway engineers, chemists, factory engineers, or smelting engineers. He must have a sound knowledge of public, administrative, and industrial law, and of political economy, the prevention of accidents, and industrial hygiene. The candidate must show that he has been actually employed as engineer or chemist in a factory, and in that capacity has become acquainted at first hand with the work, with the mode of life and thought of the workmen, and with the relations between employer and employed. This actual experience must have lasted at least three and not more than four years. After the candidate has qualified as above set forth he must go through a training lasting eighteen months, in order to prepare himself for his future inspectorial duties. During this training he is placed under some industrial authority who must present reports regarding his work, covering the following points: general capacity; facility of expression, both in speaking and in writing; personal dealings with others, especially with employers and employed; tact; and the results of official and private examination on the practice of industrial inspection, and on public, administrative, industrial and insurance law or political economy, or the prevention of accidents, and industrial hygiene. A candidate who is successful in the written examination must next pass an oral examination in law, political economy, the prevention of accidents, and industrial hygiene, and on the practical work of the department.

France: The candidate here must pass a written examination on labor laws, industrial hygiene, and industrial technology. He must also pass an oral examination in which questions are asked on the same subjects and also on electricity, and on the principles of criminal law so far as it applies to offenses against the labor law. Since 1907 candidates have also had to pass a practical examination in hygiene and applied mechanics. If successful, the candidates are appointed for two years as provisional inspectors.

England: The requirements here are a civil-service examination, an elementary education, and a practical knowledge of industrial machinery. Successful candidates are appointed for a two years' probation period. At the end of this time they are required to pass an examination in factory law and sanitary science.

Russia: Candidates for examination are chosen from among those who have had a university education, especially along technical

lines, and must then pass an examination on constitutional, civil and criminal law, political economy, labor laws, knowledge of a branch of industry in which machines are used, and sanitation.

Netherlands: Here a candidate must be a graduate of the technical high school, and must have had three years' practical industrial experience before he can be appointed assistant inspector.

Departmental Research and Educational Propaganda

In order that labor laws shall be properly administered it is necessary that special studies of particular industries be made by the administrative department.

- (a) Industries with peculiar characteristics should be especially observed to determine their effect on the worker's health, morals, etc.;
- (b) Industries absorbing large groups of children require frequent inspection to determine whether the law is observed;
- (c) Industries deemed especially hazardous also require frequent inspection to determine the adequacy of sanitation and safety devices; and
- (d) Industries causing serious injury, or frequent loss of life to workers, should be carefully studied to determine the cause of accidents.

Such special studies furnish a basis for recommendations as to amendments needed to carry out the intent of protective laws, and also as to the need for further remedial legislation.

As a means of preventing industrial accidents, traveling exhibits are effective. These often contain a selected set of stereopticon slides, charts, and photographs, with descriptions translated into foreign tongues. The slides and photographs show proper and improper guarding and operation of dangerous machinery, adequate and inadequate means of warding off occupational diseases. Frequent lectures by factory inspectors in industrial communities also go a long way in the science of prevention. The work of a few state departments in this direction is highly to be commended.

INADEQUACY OF LEGISLATIVE APPROPRIATIONS

Legislative bodies, in appropriating money for labor departments, seldom realize the tremendous task set before their officials, and as a consequence rarely make possible an equipment adequate for the work to be done. The adequacy of appropriations should be measured, among other things, by

- (a) Number of laws to be enforced,

- (b) Area of jurisdiction,
- (c) Number of establishments to be inspected,
- (d) Special inquiries to be conducted,
- (e) Cost of maintaining department,
- (f) Publication of laws, reports, bulletins, and general educational propaganda.

Unfortunately many departments have not justified to the legislature an increased appropriation. But in such cases the department needs reorganization, for there is no more important duty in any state than the conservation of the health and lives of those who labor in factory, workshop and mine.

EFFICIENCY TESTS

The amazing lack of standardization in factory inspection, and the consequent dearth of tests, have left us with nothing but the published reports of a department by which to gage the efficiency of its work. In reverting to this sole channel of information we are struck at the outset with the difference in the character of facts reported and with the varied methods of presentation. The lack of uniformity makes comparisons between states almost impossible.

The departments which submit what might be termed satisfactory reports are indeed few. New York and Massachusetts supplement their annual reports with valuable bulletins giving up-to-date facts. The Wisconsin bulletin method is also extremely effective. While other departments have produced highly interesting documents, the deplorable lack of uniformity and completeness in reports prompts the hope that some adequate standard will soon be established to which all the states will aspire.

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